STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

For forty-eight years—IRON TRADE REVIEW

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ALLOYS OF NICKEL

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As the Editor Views the News

SIGNIFICANT in the news of the week was the announcement by the federal trade commission on Friday of the first complaints of price discrimination under the Robinson-Patman act. Five respondents were named—two cheese companies, a producer and distributor of floor coverings and a mail order house. The fact that no companies identified with the iron, steel and metalworking industries are involved in the initial complaints should not deter executives in these industries from watching the hearings closely. The circumstances under which discrimination is alleged to have been practiced in these five cases probably parallel, in certain respects, those attending the distribution of certain industrial products.

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Watch These Cases Closely!

Industry cannot afford to underrate the possible implications of this price discrimination act. It may prove to be no more effective than the Sherman, Clayton and federal trade commission acts which were its predecessors in the development of anti-trust legislation. Nevertheless it is more specific than the older laws, and if administered intelligently it may exercise a marked influence upon existing practices in production and distribution. Since so much depends upon the manner in which the law is administered by FTC (p. 31), the disposition of the initial complaints (p. 16) will furnish extremely important clues to future policy.

• • •

Industry Cold To New NRA

Opinions on NRA come from two unrelated sources in the week's news. STEEL'S poll at a recent exposition (p. 18) indicates that representatives of the executive and engineering personnel of industry are more than two to one against a revival of NRA. Voters who favor Candidate Landon are almost nine to one against a return of NRA, while supporters of Candidate Roosevelt are four to three in favor of reviving it. The poll shows an equally interesting line-up of opinion on the labor question. A second view on NRA is revealed in a message from the American Institute of Steel Construction to an approaching conference in Berlin. Referring to its effort to co-operate with the government in the NRA era, the institute says its industry "is slowly reaching the conviction that such effort was misdirected and that it definitely retarded recovery."

• • •

Devaluation To Check Exports

As intimated on this page in previous issues, the time is approaching when American industrialists will be forced by self-interest to devote more attention to export markets. Already the opportunity for sales of machinery abroad has expanded and now there are signs that more steel and metal products will be required for export. Developing these reviving markets involves a knowledge of the technique of the business. European exporters, on the whole (p. 20), enjoy a larger degree of co-operation from their governments than American exporters. Our policy in this regard is deserving of study and of improvement. Devaluation of the currency of France, Switzerland and Holland (p. 21) undoubtedly will check exports to these countries temporarily. Nevertheless the foreign markets are worth cultivating more intensively.

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Here We Are In New Type!

The use of block glass instead of windows in a new Indiana industrial plant (p. 34) gives designers, engineers and owners contemplating plant construction something to think about. In addition to admitting light, the block glass panels provide a measure of insulation against summer heat and winter cold . . . . Every editorial page in this issue of STEEL was printed from type of a new face which will prove to be easier to read than the type-face used previously. Comparison of pages 14 to 30, inclusive, with the corresponding pages in previous issue will show that each letter or character is slightly larger. This also is true of the price tables (pp. 68-71). Use of the new type is in line with STEEL'S constant desire to improve its service to its readers.

E. L. Shaner

Steel Output Runs Ahead of 1930; See Strong Quarter

POURING 32,000-pound slabbing ingots at Carnegie-Illinois Steel Corp.'s South Chicago works for new continuous strip mill. Molds are 30 x 64 x 90 inches—three to four times standard sizes. Rectangular shape of ingots saves many passes in the blooming mill

NINETEEN thirty-six steel production now is definitely ahead of that for 1930. September appparently provided the output which put the nine-month period this year in the lead—a lead which from present indications will be held, making the eventual record of 1936 the best since the banner year 1929.

In contrast with this strong recovery in steel, pig iron production continues to lag behind that of 1930, unquestionably reflecting the increase in the use of scrap, and also that foundry business has not kept pace with the rise in finished steel consumption.

Notwithstanding the falling off in operations of several major consuming industries, such as automobiles, farm implements and machine tools during the third quarter demand has been sufficiently broad and diversified to sustain a steelworks operating rate close to that of the second quarter.

With September estimated at 3,950,000 gross tons, production of steel ingots in the third quarter of this year, 12,067,861 gross tons, was about 4,000,000 ahead of the 8,019,385 tons in the comparable period last year.

In all probability, output will be at least as good as this in the fourth quarter. This would result in total production of 45,463,057 gross tons for the year compared to 33,425,576 last year, 39,652,539 in 1930 and 54,164,348 in 1929. If operations average 75 per cent for the remainder of 1936, as some observers now expect, the resultant total production would be 46,206,696 tons.

Nine-months' production of ingots this year was approximately 33,395,196 gross tons. This was an increase of 38 per cent over the 24,051,412 tons in the corresponding nine months last year and three times the 10,342,520 tons produced in 1932. Nine-months output in 1930 was 32,401,901 tons, and in 1929 it was 43,353,909 tons.

Pig iron output at 21,617,500 gross tons for the first nine months of this year is 45 per cent ahead of production, 14,880,315 tons, in the same period last year. In 1930 production in the first nine months was 25,744,941 tons; in 1929, 32,662,700.

42,143 Freight Cars

Freight car awards this year show the most spectacular gains. In the nine months they have totaled 42,143, compared to 7908 in the period last year. Awards in all 1934 numbered only 23,829, and in all 1933 the total was 2460.

Automobile production at the end of the third quarter was 15 per cent ahead of last year. In the nine months this year about 3,300,000 cars and trucks have been produced in the United States, compared with 2,875,304 in the same period of 1935. Assemblies already are within striking distance of last year's total output of 3,946,934 units, and soon should pass the 1930 total of 3,355,986. The all-time record of 5,358,420 was set in 1929.

Rail orders are 83 per cent ahead of last year, totaling 554,700 tons in the first nine months, compared to 302,006 tons.

Shape awards have amounted to about 900,000 tons, 41 per cent ahead of 634,400 tons in nine months last year. Reinforcing bar awards are about even with 1935. This year to Oct. 1 they total 266,000 tons, compared to 267,451 last year.

Total business booked by the steel construction industry for the first eight months of this year was 55.2 per cent of normal as against 35.6 per cent for the same eight months of last year, according to the American Institute of Steel Construction, which bases "normal" on the annual average of the four-year period, 1928-1931. Estimated total tonnage for the entire industry was 1,034,114 in the eight months, while shipments aggregated 952,344 tons.

Ore Shipments Rising, First Vessel Construction in 6 Years Considered

WITH Great Lakes iron ore shipments apparently likely to total between 42,000,000 and 43,000,000 tons this year, and with indications that 46,000,000 to 50,000,000 tons may be moved next year, vessel owners are giving thought to the adequacy of the fleet of ore carriers.

Close to 85 per cent of the fleet of 315 vessels have been in operation at times this season, more than in any period during the last six years. Ship owners who once gloomily predicted that a large percentage of the fleet never again would be in service, have seen these same ships make more than one trip this year. Not since 1930 has the ore movement exceeded 40,000,000 tons.

In the view of some vessel operators some new capacity will be necessary when the movement reaches 47,000,000 tons a year.

Under average conditions, a large part of the fleet is uneconomical to operate because of the small size of the vessels compared to the 11,000-ton ships. The loss of carrying capacity due to small size, plus the fact that many expenses are nearly the same whether the carrier has a capacity of 7000 or 11,000 tons, place the smaller ships at a disadvantage. There are, of course, conditions under which the smaller ships are more economical.

America's lake ore carriers, exclusive of barges, have a combined carrying capacity of 2,606,400 tons per trip at a draft of 19 feet. However, 245 of these vessels, with a total capacity of 1,886,700 tons, were built before 1911, while 30 of these 245 were built before this century began.

Only 12 Since 1926

Twenty-five years is not too old for an ore carrier and most of the 245 vessels are far from obsolete, but the facts remain that since 1926 only 12 ships have been built and that many of the old carriers have been idle so long that a vast amount of repair work to plates, valves, engine beds and other parts would be required to recondition them.

Whether shippers will find it more economical to build new boats than to repair the older vessels is the question of the day on the lakes. This is borne out by reports from well-informed sources that one operator is seriously considering building two or three modern carriers.

Not since 1930, when the United States Steel Corp. built the Lamont and the Thomas, each 610 feet, and each with a carrying capacity of 11,300 tons, has a keel been laid. Never before in this century has so long an interval elapsed between the building of ore vessels.

More than 110 ships in the fleet have a capacity of 7000 tons or less. These carriers are not considered profitable at low drafts, but at this time of year, due to deeper water, they are profitable to operate. The small-type boats have been going out comparatively rapidly. The average capacity of the fleet now is 8407 tons.

Fifteen barges also are engaged in transporting ore. Their worth is considered questionable when conditions demand speedy shipments, for a steamer hauling a barge often loses time both during the trip and while the barge is being unloaded. Pittsburgh Steamship Co., Steel Corporation subsidiary last week was reported engaged in a deal to sell three of its barges to a Duluth operator.

Up to Sept. 1 the fleet moved 26,281,517 tons of ore to lower lake ports, compared to 17,386,599 tons in the corresponding period last year. The vessels now in service probably will make six trips each before Nov. 15. The September movement was about 7,250,000 tons. October probably will add another 7,000,000 tons to the total.

The fleets of 14 iron and steel and vessel interests were operating 100 per cent on Sept. 15, only a few weeks after the time some operators had contemplated laying up some of their boats.

Usually, furnace interests try to come up to May 1 each year with 20,000,000 tons in reserve at lower lake ports. If furnaces continue to operate at their high rate, however, these stocks may be gone by next May 1, according to many observers.

New Construction

GULF STATES STEEL CO., will spend about $2,000,000 on steel mill expansion at Gadsden, Ala., following financial arrangements now under way, according to L. E. Geohegan, vice president and general manager.

Proceeds of a new bond issue of $7,000,000, and sale of 98,750 new shares of stock will be used to retire existing 5½ per cent debentures, retire the preferred stock, and provide capital.

Although $21 in dividend arrearages have been declared on the 20,000 shares of preferred this year, approximately $14 in unpaid accumulated dividends will be paid

AUTOMATIC STEEL": Reducing cold-roll sheets for automobiles at Carnegie-Illinois Steel Corp.'s Gary works, this mill now being among the most modern in production. At the instrument panel, the worker controls the mill, which has capacity for 250,000 tons a year. Gage and finish—under pressure of two to three million pounds per square inch—are set accurately with these knobs and dials

when the stock is retired. The preferred is callable at $110, plus accumulated dividends. Dec. 31 $4,625,000 of 5½ per cent debentures were outstanding. The additional common stock will be issued from the authorized total of 300,000 shares, 197,500 now outstanding.

Details of the plant expansion are not being disclosed. Report was revived recently that Republic Steel Corp. was attempting again to acquire Gulf States Steel, but this is now declared "out of the picture."

SHEET & TUBE PLANS BAR MILL AT BRIER HILL

Plans for a new bar and small shape mill at the Brier Hill works are being worked out by the Youngstown Sheet & Tube Co. However, no appropriation has been made. The company has two old-style merchant bar mills at its Struthers works, but the plan calls for a modern continuous mill with far greater capacity. Plans also are being made at Campbell to move to Brier Hill the skelp mill at Campbell.

START WORK ON REPUBLIC'S COLD-ROLLED TIN PLATE MILL

Construction of the cold-rolled tin plate mill for Republic Steel Corp. at its Deforest works, Niles, O., has been started. Hunter Construction Co., has the contract, and steel shapes are being furnished by the Ohio Structural Steel Co., Newton Falls, O. It is proposed to hot-roll the material at Republic's Warren works and ship it coiled, to be finished at Niles.

DETROIT STEEL AWARDS COLD-STRIP MILL

Detroit Steel Corp. has ordered from United Engineering & Foundry Co., Pittsburgh, a 24-inch, four-high, cold-rolled strip mill, a duplicate of the one built by United Engineering & Foundry and installed for the Detroit company early in 1935. The new mill will increase annual capacity to about 200,000 tons of cold-rolled strip.

STEEL CO. OF CANADA TO BUILD OPEN-HEARTH

Directors of the Steel Co. of Canada Ltd. have authorized construction of a 150-ton open-hearth furnace at the Hamilton, Ont., plant. The company now has ten open-hearths at this plant, two 135-ton; four 85-ton and four 50-ton units.

A 33.3 per cent increase in iron and steel carloadings in the Allegheny (Pennsylvania) regional advisory board district for the fourth quarter compared with the fourth quarter of 1936 has been forecasted by shippers reporting to the Association of American Railroads.

First Patman Price Complaints Filed

FIRST complaints filed late last week by federal trade commission under the Robinson-Patman price control act names three respondents, including two cheese and one floor-covering manufacturers. Among five respondents also named as having received the preferential prices complained of was a large mail-order house.

The complaints charge each manufacturer with "discriminating in price between different purchasers of its products, with the effect of lessening or injuring competition between it and other manufacturers and distributors of similar products," and also "with the effect of lessening competition between customers, some of whom receive favored prices."

No allegation of subterfuge or secrecy on the part of any of the respondents is made in the complaints. In Washington they were considered merely as a step toward a court case, welcomed by manufacturers and distributors generally, to test the law's constitutionality.

No date has been set for hearing these complaints. Respondents are given 20 days in which to file their answers. Respondents include Kraft-Phenix Cheese Corp., Chicago; Shefford Cheese Co. Inc., Syracuse, N. Y.; Bird & Son Inc., and Bird Flooring Sales Corp., subsidiary, both of East Walpole, Mass., and Montgomery Ward & Co., Chicago.

Charges against the first and second respondents were brought under Section 2 (A), in the last complaint, Bird & Son and subsidiary, also are charged under same section, and Montgomery Ward under Section 2 (F) of the act.

In all cases except that of Montgomery Ward the charge is that there was discrimination, and against Montgomery Ward the charge is that the company knowingly received the discrimination in price, which is unlawful under the section mentioned.

Help Failed Constructors Say

THE members of the American Institute of Steel Construction and the steel industry in general co-operated sincerely with the government in its idea to regulate wages and prices. The industry is slowly reaching the conviction that such an effort was misdirected and that it definitely retarded recovery."

In its message to the Fifth International Conference on Steel Development which opened in Berlin Oct. 2, the American Institute of Steel Construction, New York, took occasion thus to summarize its experience with the government during the depression.

Owing to the proximity of the institute's own annual convention in White Sulphur Springs, W. Va., Oct. 21-23, it was unable to have delegates at the conference, but a report on the status of steel construction in the United States was sent, concluding with an invitation to a world conference in New York next year.

"The structural steel industry in the United States has shown a healthy rebound from the low point of the depression," the institute reported. "But our output this year, however, will probably not exceed one-half of normal.

"Orderly recovery is further restrained by the extraordinary burdens imposed upon business by the relief activities of the government. This brings about the imposition of a greater tax burden which will inevitably check investments and plant extensions. The size of the country, however, and its normal physical growth, has backed up such a latent demand that some of these restraining influences should be finally offset by a very natural increase in public demand for goods.

"Millions of dollars have been spent during the past three years to provide work for the unemployed, yet during those same three years even less was spent for construction materials to be used by such workmen than was spent for public works during the three years prior thereto.

Volume Far Below Normal

"Public works today, in dollar volume, is far below the normal public works requirements of this country. This results in large degree from the fact that the government has been more concerned with providing wages for the unemployed that it has been to purchase materials for them to work on.

"Public works never have and probably never will provide a market for but the lesser part of our sales. The recovery in the structural steel industry is consequently coming about by reason of the private demand for materials and construction.

"Expenditures in retail channels are practically normal. Merchant requirements, consequently, are at last stimulating the factories and we are witnessing a renewed demand for the construction of industrial plants.

"During the past four years there has been hardly any building of residences and we are faced with an incipient boom in the building of apartments, hotels and like forms of shelter."

Pig Iron Gains 4 Per Cent In September: Stacks Up 6

REFLECTING the expanding furnace capacity during the past two months, production of coke pig iron in the United States in September passed over the 90,000-ton daily rate for the first time since 1930. Six more furnaces were added during the month, raising the active total to 154. With several more furnaces scheduled for resumption shortly, production should continue to move upward.

Average daily output in September was 90,990 gross tons, according to figures collected by STEEL largely by telegraph. This was a gain of 3515 tons per day, or 4.0 per cent, over the August daily output of 87,475 tons. It is necessary to turn back to June, 1930, with 97,817 tons, to find a higher output. In September, one year ago, the rate was only 59,009 tons.

Total production for September was 2,729,705 gross tons, which, compared with the 2,711,726 tons of August, was an increase of 17,979 tons, or 0.6 per cent. This showing was made in spite of the fact that September was a 1-day shorter month than August. This monthly production was the best since June, 1930, with 2,934,503 tons. In September, one year ago, output was 1,770,259 tons.

For the nine months of 1936, iron production has aggregated 21,617,224 tons, an increase of 6,736,909 tons, or 45.2 per cent, over the output of 14,880,315 tons in the corresponding period of 1935. The 9-month total of 1934 was 13,040,414 tons.

Relating production to capacity, operations in September were at the rate of 67.0 per cent, compared with 64.3 per cent in August and 61.6 per cent in July. In September, a year ago, the rate was 42.5 per cent.

The total of 154 active blast furnaces on September 30 compared with 148 on Aug. 31 and 146 on July 31. This was the highest total attained since June, 1930, when 162 were making iron. In September, last year, only 104 were in blast. During the month, six nonmerchant or steelworks units resumed and one dropped out. Of the merchant class, two resumed and one was blown out.

Since the close of September, the active total has been increased by the resumption of a Donora, Pa., stack of the American Steel & Wire Co. Youngstown Sheet & Tube Co. is preparing to light one of its furnaces at Hubbard, O., and Struthers Iron & Steel Co. will blow in its stack at Struthers, O.

Furnaces resuming in September were: In Ohio: Hamilton, Hamilton Coke & Iron Co.; Campbell B, Youngstown Sheet & Tube Co. In Pennsylvania: Sharpsville, Pittsburgh Coke & Iron Co.; Edgar Thomson J, Carnegie-Illinois Steel Corp. In New York: Lackawanna J, Bethlehem Steel Co.; Standish, Chateaugay Ore & Iron Co. In Maryland: Maryland B, Bethlehem Steel Co. In Indiana: Gary No. 12, Carnegie-Illinois Steel Corp.

Stacks blowing out or banking were: In Virginia: Reusens, Lavino Furnace Co. In Indiana: Gary No. 1, Carnegie-Illinois Steel Corp.

American Steel & Wire Co. is dismantling blast furnace No. 2 at the Morgan Park (Duluth), Minn., plant formerly operated by the Minnesota Steel Co., as announced in STEEL for Sept. 21, page 29. Removal of this unit reduces the total number of potential furnaces in the United States from 248 to 247.

MONTHLY IRON PRODUCTION

Gross Tons

	1936	1935	1934
Jan.	2,029,304	1,478,443	1,225,643
Feb.	1,888,932	1,614,905	1,270,792
Mar.	2,046,121	1,770,990	1,625,588
Apr.	2,409,474	1,671,556	1,726,217
May	2,659,643	1,735,577	2,057,471
June	2,596,528	1,558,463	1,936,897
July	2,595,791	1,520,340	1,228,544
Aug.	2,711,726	1,759,782	1,060,187
Sept.	2,729,705	1,770,259	899,075
Tot. 9 mo.	21,617,224	14,880,315	13,040,414
Oct.		1,978,379	951,353
Nov.		2,066,293	957,906
Dec.		2,115,496	1,028,006
Total		21,040,483	15,977,679

AVERAGE DAILY PRODUCTION

Gross Tons

	1936	1935	1934	1933
Jan.	65,461	47,692	39,537	18,348
Feb.	63,411	57,675	45,385	19,752
Mar.	66,004	57,120	52,438	17,484
Apr.	80,316	55,719	57,873	20,783
May	85,795	55,986	66,370	28,784
June	86,551	51,949	64,563	42,165
July	83,735	49,043	39,630	58,108
Aug.	87,475	56,767	34,199	59,137
Sept.	90,990	59,009	29,969	50,264
Oct.		63,818	30,689	43,824
Nov.		68,876	31,930	36,124
Dec.		68,242	33,161	38,456
Ave.	78,895	57,694	43,774	36,223

SEPTEMBER IRON PRODUCTION

	No. in blast last day of		Total tonnage	
	Sept.	Aug.	Merchant	Nonmerchant
Ohio	36	34	90,399	573,110
Penna.	52	50	83,438*	798,698*
Alabama	10	10	78,488	61,917
Illinois	12	12	47,341	204,516
New York	13	11	58,861	136,634*
Colorado	1	1		
Indiana	12	12	411*	411,851
Maryland	5	4		
Virginia	0	1		
Kentucky	2	2		
Mass.	1	1		
Tenn.	1	1		
Utah	1	1	21,227*	162,814
West Va.	3	3		
Mich.	4	4		
Minnesota	1	1		
Missouri	0	0		
Total	154	148	380,165*	2,349,540*

*Includes ferro and spiegeleisen.

Patent System Centennial Will Be Celebrated Nov. 3

A nation-wide celebration of the founding in 1836 of the present American patent system will be held in Washington on Nov. 23, 1936. Dr. Charles F. Kettering, president, General Motors Research Corp.., will be chairman of the national committee. The committee includes representatives of the department of commerce, the United States patent office, the national association of patent attorneys, science museums and the industries of the nation.

A tentative program calls for a meeting on the morning of Monday, Nov. 23, in the auditorium of the building of the National Academy of Science, National Research Council in Washington, where invited speakers will address a selected audience. In the afternoon demonstrations will be held which will reveal new "invention babies"—new developments just at the threshold of usefulness in raising the standard of living.

RATE OF OPERATION

(Relation of Production to Capacity)

	1936[1]	1935[2]	1934[3]	1933[4]
Jan.	48.2	34.2	28.3	13.3
Feb.	46.6	41.4	32.5	14.3
Mar.	48.5	41.0	37.5	12.7
Apr.	59.1	40.0	41.4	15.1
May	63.1	40.2	47.5	20.9
June	63.6	37.2	46.3	30.6
July	61.5	35.2	28.4	42.4
Aug.	64.3	40.7	24.5	42.8
Sept.	67.0	42.5	21.5	36.4
Oct.		45.8	22.1	31.8
Nov.		49.5	22.8	26.2
Dec.		49.0	23.7	27.9

[1]Based on capacity of 49,777,893 gross tons, Dec. 31, 1935; [2]capacity of 50,845,741 gross tons, Dec. 31, 1934; [3]capacity of 50,975,561 tons, Dec. 31, 1933; [4]capacity of 50,313,975 tons, Dec. 31, 1932. Capacities by American Iron and Steel institute.

Many members of the Association of Iron and Steel Engineers visited the Ford Motor Co.'s plant while in Detroit

How Iron, Steel Engineers Voted on National Issues

A RECENT poll of industrial executives, engineers and employes shows a vote of more than two to one against revival of NRA and an overwhelming preference for open-shop conditions as against professional unionism.

The same poll shows that voters who favor Governor Landon are 9 to 1 against a revival of NRA while the supporters of President Roosevelt are 2½ to 1 in favor of reviving the Blue Eagle.

Again, the voters for the Kansas candidate are opposed to labor unions by more than 8 to 1, while the followers of the candidate from Hyde Park are against them only 4 to 3.

These and other indications of the attitude of men in industry are derived from straw votes cast at a recent exposition. Desiring to check views on timely economic issues held by persons who constitute a representative cross-section of the industrial personnel of the United States, the editors of STEEL conducted a poll of the visitors to its booth at the exposition held by the Association of Iron and Steel Engineers in Detroit, Sept. 22-25.

Secret ballots were used. Voters were asked whether or not they favor a revival of NRA and whether they prefer employe representative plans (company unions), professional labor unions or unorganized labor. In order to see how the views on these issues correspond with the political affiliations of the voters, three other questions were asked:

1. Who will you support in the 1936 election?
2. Who did you support in the 1932 election?
3. If you had known in 1932 what you know now, how would you have voted?

Voters Mainly Executives

The voters were mainly executives, engineers and employes of the iron and steel industry or of companies making equipment or selling services or supplies to that industry.

Results of the poll are shown in the accompanying table. It is interesting to note that of the 1284 voters who expressed opinions on NRA, 880 or 68.5 per cent are opposed to reviving it and 404 or 31.5 per cent favor its revival.

A total of 1243 voters expressed their views on the organization of employes. Of these 643 or 51.8 per cent favor employe representation plans (company unions), 284 or 22.8 per cent prefer professional labor unions, and 316 or 25.4 per cent voted for an unorganized condition. It can be assumed that ballots for employe representation plans and for unorganized labor are virtually votes for the so-called open shop. Adding the two together, the result is 959 or 77.2 per cent for open shop conditions against 28.4 or 25.4 per cent for the closed union shop.

Striking opposites in opinion are found when the vote is analyzed according to the political affiliations of the voters. For instance, of the 819 Landon supporters who answered the question regarding NRA, 733 or 89.5 per cent are opposed to reviving it, while only 86 or 10.5 per cent favor its restoration.

Of 434 followers of Candidate Roosevelt, 305 or 70.3 per cent favor the return of NRA, while 129 or 29.7 per cent oppose it. It is apparent that majority opinion in the two political camps is sharply contradictory, although the plurality against NRA is more pronounced in the Landon group than the plurality in favor of NRA among the adherents of Roosevelt.

On the labor question, 781 voters of Landon persuasion cast 700 ballots or 87.1 per cent of the total for open shop conditions and 81 or 12.9 per cent for a closed union shop status. In the Roosevelt camp, of 429 votes, 245 or 57.1 per cent were for the open shop against 184 or 42.9 per cent for the closed union shop.

Here a majority in both political groups favored the open shop but the plurality was much more positive in the Landon group than in the Roosevelt contingent.

An examination of individual ballots reveals the curious fact that those voters who will support Landon and who favor the return of NRA also vote, with few excepts, in favor of professional labor unions. Most of the 81 votes for unions were cast by persons included in the 86 who voted for a return of NRA. This close relationship between preference for NRA and labor unions was

How Iron and Steel Engineers Voted in STEEL'S Poll

Will Vote in 1936 for:		In 1932 voted for: Hoover	Roosevelt	Thomas	Did Not Vote	If had known in 1932 what know now would have voted for: Hoover	Roosevelt	Thomas	No Vote	Do you favor revival of NRA? Yes	No	No Vote	Prefers: Co. Union	Labor Union	Unorganized	No Vote
Browder	3	0	0	0	3	0	1	0	2	1	2	0	0	3	0	0
Landon	877	638	169	1	69	682	88	7	100	85	733	58	470	81	230	96
Lemke	25	6	16	0	3	4	10	3	8	8	13	4	8	9	5	3
Roosevelt	483	73	343	8	59	14	428	4	37	305	129	49	164	184	81	54
Thomas	8	1	0	6	1	1	1	6	0	4	3	1	1	7	0	0
Total	1396	718	528	15	135	701	528	20	147	404	880	112	643	284	316	153

not apparent in the ballots cast by the Roosevelt group.

Interesting deductions may be drawn from the tabulation of vote in the 1932 election and of the hypothetical vote for 1932 had the voters known then what they know now. However, STEEL is not concerned with the political aspects of the poll. The editors present the results with no editorial comment, believing that the figures themselves afford a significant sidelight on the character of contemporary opinion in a cross-section of industrial personnel.

Safety Engineers Hear Plea for Labor

J. A. VOSS, Cleveland, director of industrial relations for the Republic Steel Corp., pleaded with industrialists to strive for "a living picture of the mass troubles and tribulations that beset labor," in speaking before the metals section of the national safety congress in Atlantic City, N. J., Oct. 5.

Voss argued that "in these days, especially, when there are so many forces active to create industrial unrest and to arouse class hatred, there should be as nearly a personal relationship between employer and employe as possible."

"Intelligent employers," he said, "know that industrial relations of the right kind are essential to the success of their businesses. No longer do they regard men as commodities, to be purchased at the lowest possible rate and discarded when no longer needed. They know that employes must be as contented as ambitious men can be.

"Deserving workers must have opportunities for advancement; wages, hours and working conditions must be favorable. There must be an earnest, sincere effort to work with men, to appreciate their needs, and, as far as possible, to meet them.

"From close, friendly employer-employe relationship frequently will come the medium for placing a restraining hand on trouble and discord."

In developing good feeling among employes, Voss suggested that management prove its sincerity by telling representatives of their workers "all there is to know about the company's financial condition, its cost of operation and market conditions. Discuss with them the plant's accident record. If you are honest, and they will know whether you are or not, you will find that they are not only reasonable but sympathetic about the company's problems."

First Stainless Steel Commercial Plane Christened; Takes 1600 Pounds

THE first stainless steel plane built for commercial purposes was demonstrated at Bristol, Pa., Sept. 29 by Fleetwings Inc., and christened Fleetwings Sea Bird.

The plane, a four-passenger cabin amphibian designed for sportsmen and incorporating a number of new features, was described by Edward G. Budd, Philadelphia, at the christening, as the counterpart in airplane construction of the stainless steel, light-weight, high-speed trains built by Edw. G. Budd Mfg. Co. Like the light-weight trains, it was constructed by the "shotweld" process of fabricating stainless steel.

Wings, Fuselage "One Piece"

Through the use of this metal and process the fuselage and wing are virtually a one-piece unit. Its builders say it is lighter in weight than any other plane of comparable size, and is more fully streamlined than any other waterplane. With four passengers, 52 gallons of gasoline in two seam-welded stainless steel tanks in the wing surfaces, five gallons of lubricating oil, and 100 pounds of baggage, gross weight is 3415 pounds.

The ship is practically all stainless steel, except the engine, wing fabric, control surface coverings, and minor parts. The actual weight of stainless steel is 1600 pounds, and most of it is reported by Fleetings Inc. as having been purchased from Carnegie-Illinois Steel Corp.

In tests the plane, powered by a 285 horsepower Jacobs radial air-cooled engine mounted above the cabin, attained a speed of 150 miles per hour. It has a cruising range of 450 miles.

Performance of the ship, according to Carl de Ganahl, Fleetwings president, is due in large measure to its unusual streamlining. Even the hydraulically operated retractable landing gear contributes to the flying qualities for when the wheels are raised, all struts disappear completely into recesses in the hull.

The glistening stainless steel sheet which covers the hull is attached to stainless steel frames entirely by the "shotweld" process. The skin of the hull is therefore exceptionally smooth.

The stainless steel hull has been beautifully finished in circular knurls which give "a hitherto unobtained metallic richness of appearance." The wings, covered with airplane cloth, are finished in a silver color which blends with the stainless steel.

From tip to tip of the nontapered monoplane wing, Sea Bird measures 40 feet, 6 inches. Overall is 31 feet 5¼ inches. Wing area is 235 square feet.

Although not the first stainless steel plane, the Sea Bird is the first built for other than experimental purposes, and the first especially designed for this type of construction. In 1931, the Budd Company, copying a wooden plane, built the stainless steel Pioneer which was flown more than 1000 hours. Three years later the Savoia Marchetti Co., Budd licensee in Italy, constructed a larger and more powerful version of the Pioneer to check it against the known performance of the same model in wood.

American Machinery Gains In World Markets

BY LEWIS M. LIND
Acting Chief, Machinery Division,
Department of Commerce

BEGINNING about three years ago, and continuing to the present time, the German government has assisted export trade in machinery in a number of ways. Some of the more important parts of the program will be of interest:

1.—Exporters were allowed to reduce prices abroad, then cover losses with scrip or repatriation of bonds.

This involved permitting exporters to use part of the proceeds of their foreign shipments to purchase in the foreign market German bonds for repatriation and sale. As the foreign price of the bonds was considerably lower than the price in Berlin, the German exporters made a profit on the bonds which compensated them for the loss on goods exported. The German authorities permitted this only where the exporter could prove that he suffered a loss on the transaction and that the sale could not have been made at a higher price.

Clearing Agreements Made

2.—Clearing agreements were made with other countries.

Germany arranged clearing agreements with more than 30 countries. In some cases these clearing agreements were forced on Germany by foreign companies desiring to collect for their bondholders, while in other instances it was hoped that these separate agreements would prove to be a facile method of maintaining favorable trade balances with the other countries concerned. What happened was often not favorable to Germany. Germany's trade surplus with a group of 22 of these countries fell from 1,364,200,000 reichsmarks in 1933 to 553,600,000 reichsmarks in 1934.

3.—An export clearing fund was established to which industry itself contributed.

Early in 1935 the German government began to collect funds from industries, then made these funds available to German manufacturers who were unable to compete in the export field at regular prices. The exact extent of this form of subsidy has not been determined, but it is known to be a factor of increasing importance in the world export market.

4.—Barter transactions were arranged.

Barter transactions were no more successful than clearing agreements, although the underlying intent of the barter arrangements was not so much to increase the favorable balance of trade as to obtain raw materials not available in Germany. The procedure required was far too cumbersome. During 1934 Germany agreed to accept 20 million reichsmarks worth of Bulgarian tobacco in exchange for railroad and industrial equipment of the same approximate value.

Disposal of the machinery involved the closing of some 71 separate contracts between German firms and Bulgarian government departments. In the field of private barter, stringent controls frequently made exchange merchandise difficult.

If the commodity entering Germany were a raw material or an essential finished product not made in Germany, the value ratio of the articles exported against those imported might be 1 to 1, but if the article of importation was not considered indispensable, it was frequently required that several times its value be exported. The overseas party to the agreement had to pay for the extra goods, then find a market for it in his own country.

"Aski" Marks Used

5. "Aski" Marks.

A fifth method of stimulating exports, more important than the systems mentioned above, was by the use of "Aski" marks. These were the proceeds of authorized foreign sales in Germany, deposited in the foreigner' account and permitted to be used only in the purchase of specified German goods for export to the country of the owner of the account. Quotations on the Aski mark varied in different countries depending on the supply and demand for them.

Specific accounts of the operations of the German program taken from reports received from the offices of American commercial attaches in Brazil, Chile, Greece and Turkey show clearly how governmental assistance has been afforded the machinery manufacturers of the country, but it is not wished to give undue emphasis to this type of competition in the export field. By utilization of the mass production methods which have already won a leading position for American products, continued development of efficient machinery, and the consistent quoting of competitive prices, machinery manufacturers in the United States may expect to hold their favorable position in world markets.

A number of "industrially backward" countries have embarked upon national modernization programs during the last several years. It is only natural that there are, in these countries, an insufficient number of native engineers with training sufficient to enable them to erect such diverse installations as petroleum refining plants, flour mills, tanneries, and water systems.

German Firms Leading Quoters

German engineering and machinery firms are among the leaders in quoting on all equipment needed on any one project. Complete units are installed for municipal, provincial, and national governments. In some cases operation of the completed plant is supervised, with payment taken from the profits of the operating concern. Egypt, Turkey, and China are among the export markets for this type of activity.

Recent issues of *World Machinery News*, a monthly bulletin of the machinery division, department of commerce, have mentioned how one German manufacturer of brewing machinery has received orders this summer for complete installations in Argentina, Brazil, Sweden, Japan, and Russia.

Notwithstanding the factors which tend to assist or force sales of German machinery abroad, there is good reason to feel that Germany is not ahead of the United States in the equipment markets of the world. It has been shown previously in this article that in 1932, 1933, and 1934, respectively, the German shares of the total exports of the "Big Three" were 50.5, 46.5 and 38 per cent, while the comparable participations of the United States

SECOND and concluding installment of an article written for STEEL *by Mr. Lind. The first part was published in* STEEL, *Sept. 28 page 22.*

were 24.5, 24.5, and 31.5 per cent in those years.

When the figures previously listed as the monthly average of German machinery exports for 1933, 1934, 1935, and for the first five months of this year are converted into dollars at the appropriate exchange rates and compared with American exports of the same commodities, we get a good picture of the startlingly close race for export markets between the two countries from month to month. There are included industrial machinery and office, printing, and agricultural equipment. Electrical equipment is not included.

	Exchange rate of reichsmark	German Exports (000 omitted)	United States Exports (000 omitted)
1933 (mo. av.)	$0.3052	$13,805	$ 7,413
1934 (mo. av.)	0.3938	14,984	12,652
1935 (mo. av.)	0.5026	15,505	15,779
1936 January	0.403	19,452	19,700
February	0.403	19,554	18,328
March	0.403	18,116	20,353
April	0.403	19,630	21,821
May	0.403	19,795	21,162

(These rates for the reichmark are nominal and are not a true rate at which exports were sold. Aski marks and other "blocked" marks were used to some extent and sold at a considerable discount from the nominal rate. To that indeterminate extent, therefore, the trade is still more in favor of the United States.)

Although the practice of forecasting the future is not as safe an activity as explaining the causes for events which have already occurred, it is none the less possible to mention a number of factors which will tend to maintain American machinery in a leading position in the world's export markets.

It is doubtful whether the Reich, barring currency devaluation, will be able to intensify to any further appreciable degrees the efforts already taken to expand the world markets for German machinery.

There is a natural limit to the export subsidizing possible for a nation in Germany's financial situation. Following the same line of reasoning, the ingenious barter arrangements already made, while promoting equipment exports and securing raw materials and foreign exchange for Germany during this period of great need, wil eventually reach a point beyond which it would be extremely difficult to obtain practical advantages.

At the present time it looks as though both Germany and England will for many months be chiefly occupied in filling domestic orders, and, while the machinery builders of those countries will continue to sell abroad in large volume, their principal interests and obligations for a year or more will be to meet the demand within their borders.

View Franc Devaluation as Check on Steel Exports

NEW YORK

DECISION of the gold bloc countries to debase their currencies has caused much confusion, but it generally is considered in foreign trade groups here as a salutary move.

Despite the fact that the devaluation of currency is an inflationary gesture, American steel sellers believe it will stabilize foreign exchange for a considerable time.

France, it had long been known, had been getting in deeper and deeper financially. An unbalanced budget, with weakening confidence in the franc and the flight of gold to other countries, accelerated in recent months by the radical trend of her government, made it appear inevitable that debasing of the franc must come. But how and when were the questions, and this uncertainty has been reflected in foreign trade for many months. Now these questions have been answered, in part.

Meanwhile, the more immediate effects are being weighed. Currency devaluation in itself should stimulate exports for the countries taking such action, and at the same time set up barriers on importations. The action on the part of France, Holland and Switzerland comes at a time when steel exports to Europe from this country are expanding.

Debased Currency Is Check

Debased currency abroad should theoretically, check this expansion. American steel, it is pointed out, might more likely suffer most indirectly through the possible checking of exports of automobiles and machinery to European countries. These exports, particularly in recent months, have been heavy. This, too, is the view expressed by financial and foreign trade experts at the department of commerce, Washington.

Also, American steel producers should feel the effects of sharper competition of the foreign countries which are devaluating. Foreign steel should be able to come into the United States more easily and should prove more attractive in world markets.

It is pointed out that when England first devaluated she raised the price of many of her export products to a point which virtually offset the devaluation. With a strong iron and steel market abroad at this time France, which in many months has not been a large exporter of steel to this country, may be tempted to do the same; and also the other members of the late gold bloc.

Another factor may be higher costs of importing raw materials for iron and steel manufacture into France and Holland. France should be able to obtain most of her iron ore requirements from her colonial possessions, and if the Russian ruble follows the franc in devaluation, as now appears probable, France should not suffer greatly in drawing upon Russia.

The position of Holland, which has been a particularly large exporter of pig iron to the United States, should be fairly comparable to France with respect to raw materials, it is said; she should able to obtain most of her outside materials without too much premium.

Another consideration is the attitude of French labor. To the average Frenchman debased currency means higher living costs, with few or no reservations. The French workman has been constantly in the ascendancy in recent months. Will he overlook this chance for still higher wages, with subsequent higher production costs?

In Holland bills have been passed which in addition to providing for a gold embargo and the creation of a stabilization fund, will prevent "sharp price rises."

American consumers of foreign ores may stand to benefit by recent exchange developments, certainly not lose. It is believed, though, in view of the Spanish rebellion, which has shut off large supplies, the strong demand abroad and the continued substantial buying here that there will be no early reduction in price, but possibly an advance.

Attention of American scrap exporters centers largely at the moment on Italy, which, along with Japan, has been a heavy buyer of scrap from this country. In view of the possibility that France, with her devalued currency, may be able to attract scrap business from Italy at the expense of the United States, some leading sellers here are keeping one eye on France's currency ratio and the other on the Italian lira. Current reports from Italy are that there might be an "export lira," which would be 20 to 30 per cent under the domestic lira, but to some leading interests here this does not precisely make sense and further information is awaited.

Men of Industry

DOUGLAS G. BUCHANAN, assistant general superintendent since 1935, has been named general superintendent of the Vandergrift works, Vandergrift, Pa., Carnegie-Illinois Steel Corp. He succeeds W. L. Goodhue, retired. Other personnel changes made by Carnegie-Illinois in its operating and sales staffs are as follows:

Frank J. Christie, superintendent of the sheet mill department, has been made assistant general superintendent of the Vandergrift works, succeeding Mr. Buchanan. A graduate of Allegheny college, he began his career with the United States Steel Corp. at the Farrell works of the Carnegie Steel Co. in 1914.

Carl E. Crawford has been appointed general superintendent of the Shenango works, New Castle, Pa., succeeding David S. Pyle, who, as reported in STEEL, Sept. 21, page 30, has retired as general superintendent of both the Shenango and New Castle plants. Mr. Crawford formerly was assistant general superintendent at the Shenango plant.

R. E. Sturdy, assistant general superintendent of the New Castle works since January of this year, has been appointed general superintendent, succeeding Mr. Pyle.

Theodore W. Daniels has been made assistant general superintendent of the Roll and Machine Works at Canton, O. He formerly had been superintendent of the Mackintosh-Hemphill Co., Pittsburgh.

Howard V. Clark has been appointed general manager of the order division of the general sales department, with offices in the Carnegie building, Pittsburgh, and at 208 South LaSalle street, Chicago. This is a newly created position and will consolidate under Mr. Clark's supervision the several order divisions of the former Carnegie Steel Co., Illinois Steel Co., and American Sheet & Tin Plate Co. He leaves the post of assistant manager of sales for the Detroit district to take up his new duties.

Wilbur G. Somes has been appointed manager of sales in charge of the St. Paul-Minneapolis district, succeeding L. B. Worthington, who has been promoted to the Detroit sales district. He served as assistant manager of sales at Cincinnati from 1931 until the present.

Mr. Worthington has been appointed assistant manager of sales at Detroit. Following graduation from the University of Illinois, he started his career as an apprentice at the South Chicago works of the former Illinois Steel Co.

Howard V. Clark

Wilbur G. Somes

L. B. Worthington

♦ ♦ ♦

J. W. Weitzenkorn, former president of the Molybdenum Corp. of America, has become associated with the Ohio Ferro-Alloys Corp., Canton, O., as director of research.

♦ ♦ ♦

Walter A. Parrish has been appointed chief engineer of the Buda Co., Harvey, Ill. He has been identified with Buda Co. since 1928, and before that was with the Hudson Motor Car Co.

L. C. Moxie, who has been with the company almost continuously since 1922, has been promoted to assistant chief engineer.

♦ ♦ ♦

F. A. Hurcomb, formerly vice president and general manager of the Federal Machine & Welding Co., Warren, O., has been named general plant manager in charge of production of the Edwards Iron Works, South Bend, Ind. Other officers are: W. Howard Edwards, president; Paul Castner, general sales manager; Ralph H. Wise, chief engineer; and E. A. Sommers, director of purchasing.

♦ ♦ ♦

Joseph Davis has resigned as executive vice president of American Locomotive Co., New York, and as a director, member of the executive committee and president of Alco Products Inc., a division of the American company, due to ill health.

David Dasso has been elected vice president of the American Locomotive Co., diesel engine division, succeeding R. B. McColl, who has resigned to become president of Alco Products Inc.

♦ ♦ ♦

H. D. Whittlesey, first vice president and director of sales and distribution for the Sherwin-Williams Co., Cleveland, will now devote his entire time to executive duties and allied connections of the company, as a result of three major promotions announced last week by George A. Martin, president.

A. W. Steudel, vice president, has been made vice president and general manager, and K. H. Wood will take over the duties of director of sales and distribution.

♦ ♦ ♦

Walter L. Loegler has been appointed manager of the Chicago office of the Warner & Swasey Co., Cleveland, following nine years in charge of the company's Dayton territory. Mr. Loegler has been associated with Warner & Swasey since 1912. He succeeds G. Kochenderfer,

Albert Schnaitman, who joined the company in 1928 and has re-
ritory. Mr. Loegler, identified with Warner & Swesey sonce 1912, succeeds G. Kochenderfer, resigned.

♦ ♦ ♦

Herbert A. Baker has been elected president of the American Can Co., New York, succeeding C. E. Green, resigned. He had been vice president in charge of sales since 1932. He has been connected with American Can since graduation from the University of Toronto in 1906, and

(*Please turn to Page* 28)

Porcelain Enamel Institute Meets

SENSIBLE social reform is the responsibility of the American business man rather than radical politicians," R. G. Calton, president, Porcelain Enamel institute, said in his address which opened the sixth annual meeting of the institute in Cleveland Oct. 2.

"Industry must anticipate social needs and trends," he stated, "and make reasonable adjustments by using its practical knowledge in initiating legislation which will bring about the needed reforms, and yet maintain the economic system upon which this country is founded."

The remainder of the first session was taken up with reports and election of officers. The afternoon session and the sales conference Oct. 1 featured several papers of technical interest to the porcelain enamel industry which will be referred to in subsequent issues of STEEL.

Officers were re-elected. They are: President, R. G. Calton, Tennessee Enamel Mfg. Co., Nashville; vice presidents, F. E. Hodek Jr., General Porcelain Enamel & Mfg. Co., Chicago, and Emery L. Lasier, Titanium Alloy Mfg. Co., Niagara Falls, N. Y.; treasurer, William Hogenson, Chicago Vitreous Enamel Product Co., Chicago.

The new board of trustees includes the officers and the following:

R. A. Weaver, Ferro Enamel Corp., Cleveland; W. R. Greer, Baltimore Enamel & Mfg. Co., Baltimore; O. Hommel, O. Hommel & Co. Inc., Pittsburgh; R. W. Staud, Benjamin Electric Mfg. Co., Desplaines, Ill.; W. H. Brett, Enamel Products Co., Cleveland; M. N. Hurd, Ingram-Richardson Mfg. Co. of Indiana, Frankfort, Ind.; E. H. Weil, Vitreous Steel Products Co., Cleveland; F. S. Davidson, Davidson Enamel Products Inc., Lima, O.; Earle S. Smith, Toledo Porcelain Enamel Products Co., Toledo; W. A. Donald, Vesco Sales Corp., New York; Gustave Oesterle, U. S. Porcelain Enamel Co., Los Angeles; Louis Ingram, Ingram-Richardson Mfg. Co., Beaver Falls, Pa.; George S. Blome, Baltimore Enamel & Novelty Co., Baltimore; J. T. Penton, California Metal Enameling Co., Los Angeles; M. J. Saltzman, Porcelain Metals Inc., Long Island City, N. Y.; H. H. Wineburgh, Textile Inc., New York; R. L. McGean, McGean Chemical Co., Cleveland; L. D. Mercer, Republic Steel Corp., Cleveland; Bennett Chapple, American Rolling Mill Co., Middletown, O.; F. S. Corrigan, General Steel Wares Ltd., Toronto; W. L. Lawson, Harshaw Chemical Co., Cleveland.

Koppers Realigns Names

Due to its forthcoming refunding program, which will involve financing of between $25,000,000 and $30,000,000, Koppers Gas & Coke Co. has changed its name to Koppers Co. Change in titles has also been carried out in connection with parent companies of Koppers Gas & Coke Co. so as to avoid title similarities. The Koppers Co. of Massachusetts will hereafter be known as the Koppers United Co. and the Koppers Co. of Delaware has changed its name to Koppers Associates Inc.

District Steel Rates

Percentage of Open-Hearth Ingot Capacity Engaged in Leading Districts

	Week ended Oct. 3	Change	Same week 1935	1934
Pittsburgh	75	+1	48	18
Chicago	74	+1	60	26
Eastern Pa.	49	+ ½	37	17
Youngstown	80	none	56	29
Wheeling	95	none	81	33
Cleveland	82	+1½	62	28
Buffalo	81	none	52	24
Birmingham	64	none	55½	25
New Engl'd	88	none	66	40
Detroit	95	none	94	59
Cincinnati	84	none	†	†
Colorado	63	none	†	†
Average	74½	+1½	53½	25

†Not reported.

August Iron, Steel Exports Down

BOTH in quantity and value, exports of iron and steel products from the United States in August fell short of July. The metals and minerals division of the bureau of foreign and domestic commerce points out, however, that the August trade topped that of August, 1935, by 12.5 per cent in quantity and 21.6 per cent in value.

ADDITIONAL news of the iron and steel industry will be found on pages 86, 87 and 88.

The August total of 278,378 gross tons, valued at $8,839,428, included 199,649 tons ($2,565,635) of scrap materials and 78,729 tons ($6,273,793) of finished and semifinished iron and steel.

The trade in scrap was approximately 1800 tons larger than shipments in July, but foreign sales of the more advanced manufactures declined by some 20,000 tons. In the latter group the chief products exported during August were tin plate, 14,641 tons valued at $1,482,792; black steel sheets, 7115 tons worth $462,986; "other" plates, 6740 tons priced at $279,309; and skelp, 5675 tons at a cost of $186,972.

Over the elapsed eight months of 1936 total exports of iron and steel have reached a figure of 2,206,707 gross tons valued at $72,955,415—this total being well above that for the same period of 1935, when shipments totaled only 2,136,781 tons valued at but $58,593,554.

Trade in finished and semifinished iron and steel gained both in quantity and in value, the eight months' 1936 figures being 723,318 gross tons valued at $54,874,457; and those for 1935, 615,591 tons valued at $42,224,873.

Production

STEELMAKING gained 1½ points last week to 74½ per cent, setting a new peak since the spring of 1930. This compares with 53½ per cent in the week of 1935, and practically triples the rate in the same week of 1934. Heavier schedules at Pittsburgh, Chicago, eastern Pennsylvania and Cleveland supported this increase. Details follow:

Youngstown—Unchanged at 80 per cent last week, with tentative schedules indicating no change this week.

Cleveland—Rose 1½ points last week to 82 per cent, due largely to National Tube Co. at Lorain putting on an additional open hearth to operate all 12. Corrigan, McKinney still continues with 12 in production and Otis Steel Co., with all 8.

Buffalo—Steady at 81 per cent last week, with little change expected in the early part of this month. Thirty open hearths are active.

Chicago—Advanced 1 point to 74 per cent, a new high for the year. A further increase is in prospect this month, while at least one additional blast furnace is scheduled to be relighted. Twenty-four of 41 stacks are active.

Central eastern seaboard—Up fractionally to 49 per cent, with little variation expected this week. Finished steel demand is leveling off, but operations are being fully sustained with producers endeavoring to work off shipments against recent heavy buying.

Pittsburgh—Up 1 point to 75 per cent, establishing a new seven-year high. Operations last week were based on a 73 per cent rate by Corporation subsidiaries and an average of 75-80 per cent by independents. Forty steelworks blast furnaces are active.

Wheeling—Unchanged at 95 per cent, 35 open-hearth furnaces out of 37 were making steel.

Detroit—Without change at 95 per cent, based on steel ingot melting schedules in 20 out of 21 basic open-hearth furnaces. One producer is operating 11 of 12 units and the other all nine.

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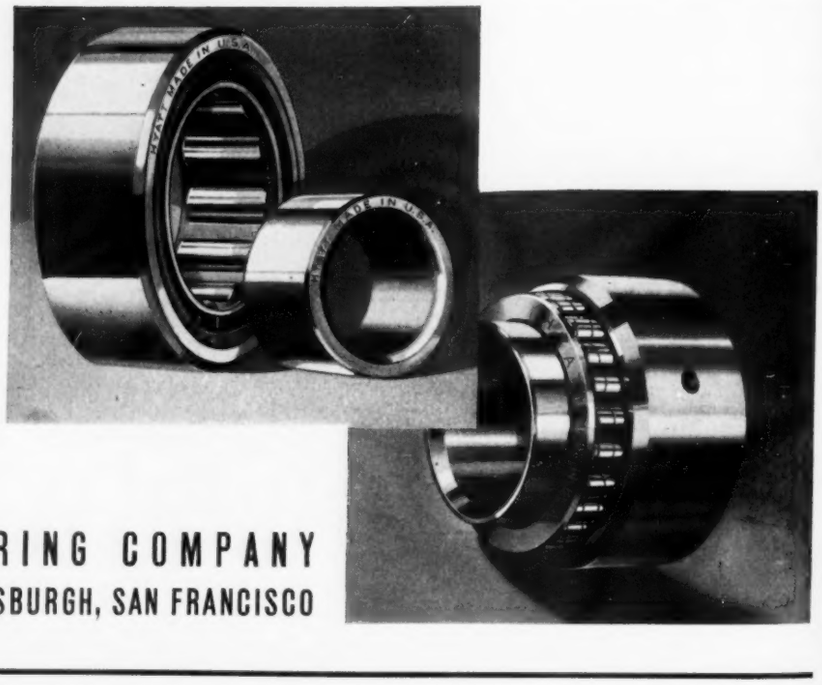
By virtue of the scope of its resources, the skill of its technicians, the profit of its experience, Hyatt produces the finest roller bearings. Bearings that endure the merciless punishment of speed, stress, and shock without perceptible wear. Bearings that defy the imagination in their matchless perfection. Husky bearings that keep related parts in permanent alignment. Bearings that serve longer and more efficiently, with the minimum of maintenance.



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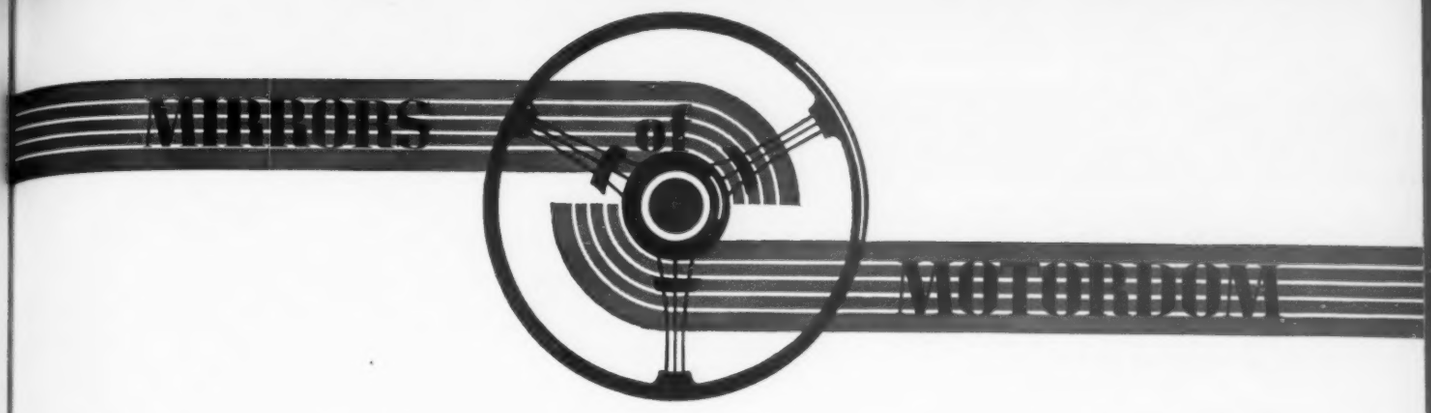


DETROIT

THIS is the season for football and it is also the time of the year when most of the retail automobile distributors begin looking up time tables to Detroit. The annual dealer pilgrimage back to the factory is on.

For these occasions just before the new models come out the motor plants usually set aside two or three days for all their field men to come back home en masse. In a spirit of all-is-forgiven, the factory shows them the coming lines, walks them through the plant and dispenses a little conviviality, also a double dose of sales enthusiasm for the coming year.

Right now the trek is on full swing. Hudson went through the procedure last week, followed by Buick, Olds and many more this week and next.

While the distributors regret that there isn't a world series here now as during the last two years, they haven't much kick coming from the new cars they are privileged to peek at.

Comfort To Be Selling Point

As this column has repeated, the automobile industry has gone in heavily for riding comfort in next year's models. Roomier bodies—meaning more leg, lounging and luggage room—are the features for 1937. So obvious a comfort point shouldn't be hard to sell to the layman who might be quizzical on mechanical changes.

The Hudson group, for one, thinks so. For the 1937 lines of Hudson eights and sixes and the Terraplane six are all longer, lower and wider than their 1936 predecessors. That all new body panel, fender, hood and top dies of a major character were ordered throughout for 1937 is evidence of the fresh slant Hudson took on design.

In outward appearance, the lines are moderately more streamlined over 1936, yet have not joined the Lincoln-Zephyr school. Hudson's lines are two inches longer in wheelbase with a corresponding increase in overall length. The bodies are some six inches wider at the extreme, giving rise to a claim that four can be seated in the front.

Consequently, rear fenders have yielded much of their former width, likewise running boards, yet are still significant enough to cover the radio antenna. A smooth dome-type fender without crimp is used in both the front and rear.

Front Has Ventilation Louvres

The front end appearance—criterion to many—retains a vestige of 1936 design but with an important addition. Down each side of the radiator shell in two distinct sections each covering the lower half of the shell are ventilation louvres. Each is comprised of 21 horizontal fins, stamped from the shell itself and painted in body finish. These vents feed into ducts which lead back under the front wheel housing to cool the engine compartment. Stainless steel plays an important part on the vertical shell band, beads embellishments. Headlamps are mounted directly on the hood with horizontal braces, rather than on the fender as this year.

Inside, since both front and rear seats are more shallow, an increase in leg room is noticeable. Doors are some three inches higher. Hinged toward the rear on both two-door and single door models, they open from the front, opposite from the 1936 style. The swing on all doors is in a wider arc. All luggage compartments have been increased in capacity. The instrument board compartment, for example, has 1000 cubic inches, laying claim to the world's largest.

Seats on the one-door model are "arculated," a pivot arrangement under the driver's seat permitting the entire front seat to swing in a moderate arc, thus giving easy access to the rear.

A new double-X frame is used with X-bracing both in the center and again with a smaller member under the radiator shell. Frames are deeper and the larger X-reinforcing member more sturdy than a year ago. To accommodate the six-inch wider body in parts, the frame has been widened and also redesigned for the lower road clearance.

Neither Hudson nor Terraplane went to the hypoid gear in the rear axle, a mechanical change which many cars like Buick, Studebaker and Dodge are taking this year from Packard, so as to set car floors lower and at the same time eliminate drive-shaft "hump." Withal the shaft tunnel in the rear compartment is scarcely apparent in the Hudson lines.

Much stress will be laid next year by Hudson on a newly-developed body color, "royal maroon," a rich hue, which, it is claimed, completely solves the fading problem. "Royal maroon" will be one of seven standard colors: black, "midnight blue," "ocean blue," "spruce green," "acorn tan" and "gunmetal gray." Five optional colors, all light, are offered.

Mechanically, Hudson stands pat with its eight and six-cylinder motors, but has marked up horsepower about 10 per cent in each. The motor's power-eight ratio is unchanged. A new double carburetor is a feature and is listed as standard on all but the lowest-priced Terraplane. An economy saving of about 10 per cent is claimed through independent manifolding.

Front Springs Carried Over

Semi-elliptical front springs are carried over, likewise hydraulic brakes, although the latter have been augmented with a safety device that automatically engages the mechanical hand brake in the event of failure. Steel top and "electric hand" are continued.

Body hardware has been redesigned, including a "hand-form" door handle, restyling of the instrument board fixtures and adoption of a new composition material, over steel, for the driver's wheel. A Y-shaped windshield defroster is standard equipment.

Tires are larger. The battery has been taken up to a position at the right side of the motor and is accessible through the hood.

Prices, as yet unannounced until public showing in a few weeks, likely will be close to those of 1936. Terraplane will be unchanged, but there is a possibility that Hudson will be slightly less. On the 1936 jobs the Terraplane started at $615,

the Hudson six at $730 and the eight at $790.

All in all, steel as a material in these models loses no ground and gains some, mainly through the wider body and heavier frame.

So, the Hudson dealers all have been wined, dined and sent home happy. This week more than 6000 field men of Buick descend on Flint to stay on until Oct. 13 at the latest and look over this new General Motors entry.

They will see a new front-end treatment, hypoid rear axle gears and the complete disappearance of wood from bodies and doors but under the hood a perpetuation of many 1936 features.

Horsepower Increased

One exception to the last statement is the increase in horsepower from 93 to 100 on the "40" series and from 120 to 130 horsepower on motors for the "60," "80," and "90." Wheelbases on the "40" and "60" have been lengthened four inches. The former will now be 122 and the latter 126 inches. The "80" wheelbase at 131 and the "90" at 138 are both unchanged.

The motor, still a straight eight, has been improved with a built-in choke and a Stromberg-Carlson carburetor that acts to prevent stalling. The former problem of a lean mixture on downhill runs and a rich mixture on uphill climbs has been remedied thereby.

But it remains for the front end to supply the distinguishing features. The radiator shell is a three-piece job, two of which are rectangular shaped units made up entirely of horizontal fins, chromium plated. Each is bolted into the shell at three points to permit ready access or replacement.

Turret top, knee-action, ride stabilizer and valve-in-head engine are all carryovers for Buick, but hypoid gears in the rear are new and give the body a position closer to the road. In spite of the fact that Buick has had a weather eye cocked for some months on automatic transmission, it is not offered even optionally this year.

Bodies are slightly wider but not noticeably so. The radio loud speaker is mounted directly in the center of the instrument panel. Flexible steering wheels are standard, likewise double rear lights, double horns and a larger diameter hub cap. Most of the body hardware is heavier.

Front headlamps are mounted on the hood without any supporting bracket. The rear lamps flash on at night in unison with a rear lamp placed in the center of the rear trunk panel and directly over the license plate.

Elimination of wood from the Buick doors and bodies this year, and in fact from all of the General Motors models except LaSalle and Cadillac, will be an important contribution to increased steel tonnage.

Panels Take More Steel

These new ribbed steel members for the doors and side panels will account for something like 15 per cent more steel per General Motors car on the average. In fact, in weight per car it will likely add some 60 to 65 pounds. And, being hot-rolled finish, the new usage will bring the percentage of hot-rolled sheets per model up to about 50 per cent, or equal in importance with cold rolled. Formerly there had been about a 70-30 ratio, cold rolled sheet, of course, leading.

The other increment to steel next year is in the replacement of the soft top with steel. All of the important makers, except Packard, will have a solid steel piece roof. This new use adds about 50 to 60 pounds of steel more per car. Incidentally, Ford, a 1937 convert in this respect, seems to be having trouble with working out location of the radio antenna on its coming steel-top jobs.

But all of the attention paid to flat-rolled steel by the motor makers has had some saving grace. The widespread talk of a few years ago to get wider and wider sheets so that the body makers could stamp a car out in two halves like an oyster, and then weld it together, has pretty much vanished.

Instead of rolling 100 and 110-inch widths, which were talked of at the time, the body builders seem content with 73 to 75-inch widths in most of their specifications. In fact, most do not go over a 73-inch maximum although such as the 1937 Hudson top piece is made from a 75-inch wide sheet.

Packard Takes 225-Inch Sheet

On length, the most extreme specification this year is a 225-inch sheet from Packard, but this is being slit. Even the new Ford top, cowl and back panel—made from one sheet—requires only 137-inch length. Earlier in the year Fisher Body kept an idea warm to use a 270-inch long sheet, but gave up the thought after experimental runs.

Ford closed down last week from Tuesday night through Sunday, or from Sept. 29 to a reopening date today, Oct. 5. Purpose of the closing was for annual inventory-taking, a task long delayed due to the fact that Ford assembled 1936 jobs later than any other in motordom.

Difficulties getting the bugs out of the steering device, front end and transmission simmer down as the three major stumbling blocks currently at Ford. Virtually all of their difficulties, as the 1937 job is about ready to be thrown on the line, could be traced last week to clearing up details on these three. More than any other reason they have precluded Ford buying ahead more generously of materials.

This week, however, important steel buys on parts for the three parts aforementioned plus a large sheet buy are expected in the market out of Dearborn.

Of all the major car makers, Ford has bought ahead the least on materials and even though Dearborn had orders out last week to have materials at hand Oct. 5 for 100,000 assemblies, the 30-day float idea at Dearborn has not been changed. Ford has only bought ahead for around 200,000 jobs.

By contrast, a cross section of General Motors through Fisher Body, which has completed placing of steel orders enough for 500,000 assemblies and Chrysler for 350,000 jobs, are each avowed on a 60-day float.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1934	1935	1936
Jan.	155,666	289,728	364,004
Feb.	230,256	332,231	287,606
Mar.	338,434	425,913	420,971
Apr.	352,975	452,936	502,775
May	330,455	361,107	460,565
June	306,477	356,340	452,955
July	264,933	332,109	440,999
Aug.	234,811	237,400	271,291
Sept.	170,007	87,540	*119,073
9 mo.	2,384,014	2,875,304	3,320,239
Oct.	131,991	272,043	.....
Nov.	83,482	395,059	.....
Dec.	153,624	404,528	.....
Year	2,753,111	3,946,934	.....

*Estimated.

Estimated by *Cram's Reports*

Week ended:

Sept. 5	31,628
Sept. 12	26,750
Sept. 19	33,615
Sept. 26	15,680
Oct. 3	22,800

PRODUCTION NOTES

THE glove box compartment and its dash-board assembly on the modern automobile, calls for simplicity, convenience and speed in installation . . . *all* . . . accomplished with SPEED NUTS.

Cut-away sketch illustrates No. 180 SPEED NUT snapped into self retaining position. Final installation effected with a sheet metal screw which being pointed offers rapid assembly with SPEED NUT in blind location . . . Machine screws, wood screws, sheet metal screws or rivets may be used with SPEED NUTS . . . Write for card of assorted samples and list of their many established uses.

Speed Nuts PATENTED

INNERMAN STOVE & RANGE CO. · *SPEED-NUT DIVISION* · CLEVELAND, OHIO

Men of Industry

(*Concluded on Page 22*)

in this time rose through the laboratories and sales division of the company.

♦ ♦ ♦

Lester M. Curtiss, heretofore superintendent of production at Lukens Steel Co., Coatesville, Pa., has been promoted to assistant general superintendent. He was graduated from Lafayette college, Easton, Pa., in 1915 and in the same year joined Merck & Co., Rahway, N. J., serving in the chemical manufacturing department for a year. He then joined Harrisons Inc., Philadelphia, working in the acid manufacturing department until August, 1917. During the war Mr. Curtiss served as

Lester M. Curtiss

first lieutenant in the field artillery.

In the 17 years Mr. Curtiss has been identified with Lukens, he has served as assistant engineer of tests, engineer of tests, assistant superintendent of plate mills, superintendent of Lukens 140-inch and 206-inch mills, superintendent of plate mills and superintendent of production. He is the author of "The Rolling of Stainless Plate" and the monographs on "Machine Gas Cutting."

♦ ♦ ♦

David H. Bellamore, general export manager, Republic Steel Corp., Cleveland, sailed last week for a two months' vacation abroad.

♦ ♦ ♦

Myron C. Taylor, chairman of the board, United States Steel Corp., New York, has returned from a trip abroad.

♦ ♦ ♦

C. H. Fowler, plant and construction engineer for the Ferro Enamel Corp., Cleveland, has severed his connections with that company to join the H. K. Ferguson Co., Cleveland.

♦ ♦ ♦

C. E. Maeder, for a number of years associated with Barton Shover, Oliver building, Pittsburgh, consulting steel mill engineer, whose death is noted in STEEL this week, will continue to operate the business at the same location.

♦ ♦ ♦

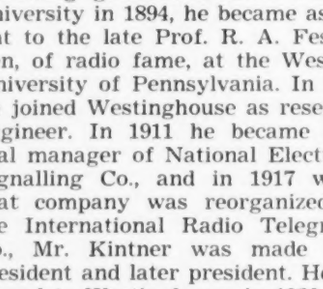
M. W. McDonald, comptroller, Dominion Steel & Coal Corp. Ltd., Sydney, N. S., has been appointed secretary and treasurer, succeeding C. S. Cameron, who is resigning because of ill health. Mr. Cameron will continue as a director and vice president of the company. Chris. Spiers succeeds Mr. McDonald as comptroller.

Died:

DR. SAMUEL M. KINTNER, 64, vice president in charge of engineering, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., in Pittsburgh, Sept. 28. He was internationally known in the engineering world for his research work and pioneering in the development of radio communication and broadcasting.

After spending a year on telephone construction and operation, following graduation from Purdue university in 1894, he became assistant to the late Prof. R. A. Fessenden, of radio fame, at the Western University of Pennsylvania. In 1903 he joined Westinghouse as research engineer. In 1911 he became general manager of National Electrical Signalling Co., and in 1917 when that company was reorganized as the International Radio Telegraph Co., Mr. Kintner was made vice president and later president. He returned to Westinghouse in 1920 and in 1922 was appointed manager of the research department. In 1930 he was made assistant vice president in charge of engineering activities, and in 1931 was elected vice president.

He was a member of the American Institute of Electrical Engineers, Engineers Society of Western Pennsylvania, National Electric Manufacturers association, among numerous other associations.



Dr. Samuel M. Kintner

♦ ♦ ♦

Barton R. Shover, 68, widely known iron and steel engineer, of heart attack, in Pittsburgh, Sept. 28. Not only was he active in consulting work and iron and steel plant construction in the United States, but he also was widely known abroad. Among other projects, he built the Tata Iron & Steel Co., Jamshedpur, India, and he also was consulting engineer for many of the projects now included in the Dominion Steel & Coal Corp. Ltd., Sydney, N. S. Recently he was consulting engineer for the Pittsburgh Crucible Steel Co. in the development of the electrolytic process for making tin plate. He was the inventor of a process for remelting scrap in the electric furnace.

♦ ♦ ♦

Edward J. Zahner, 54, president, Metal Door & Trim Co., La Porte, Ind., in that city Sept. 23.

♦ ♦ ♦

Leonard A. Lark, 57, secretary, Briggs Mfg. Co., Detroit, in that city, Sept. 24. He had been associated with Briggs for the past 16 years.

♦ ♦ ♦

Charles T. Seybold, 78, founder of the Seybold Machine Co., which in 1927 was merged with the Harris-Seybold-Potter Co., Cleveland, in Dayton, O., Sept. 27.

♦ ♦ ♦

Henry E. Morton, 73, president since 1909 of the Morton Mfg. Co., maker of special machinery, Muskegon Heights, Mich., in that city Sept. 29.

♦ ♦ ♦

John H. Francis, 74, president, Kilby Mfg. Co., Cleveland, in Shaker Heights, O., Sept. 20. He started with the company 50 years ago, becoming foreman, superintendent, manager, general manager and president, was on the advisory board of the Gray Iron Founders' Society Inc., and a member of the Cleveland chamber of commerce.

♦ ♦ ♦

Harold C. Smith, 54, president of the Illinois Tool Works, Chicago, in that city, Sept. 29. Mr. Smith was graduated from Princeton university in 1904 and was named head of the Illinois Tool Works in 1915. He was at times a director of the Illinois Manufacturers' association and the National Association of Manufacturers.

♦ ♦ ♦

Fred D. Kennedy, 66, for 43 years in various engineering capacities with Westinghouse Electric & Mfg. Co., at Pittsburgh, Sept. 28. He was a recognized authority on mechanical details of railway and locomotive equipment and as such had been attached to the staff of the general works manager.

WASHINGTON

ALL indications point to the fact that the federal trade commission will not try to abolish the basing point system, as a whole, through the Robinson-Patman law. No official of the commission will be quoted on the subject, however.

Renewed interest in this matter has been shown recently because of the comment of Roger Babson, who expressed the opinion that the commission probably would do away with the basing point system under authority of this new law.

Mr. Babson is reported to have said that the basing point system would be upset by the commission in its administration of this act. He interprets the law to mean that all basing point plans are out because they impose a price discrimination against those buyers living at a distance from the manufacturing plants.

Members of the commission and their experts repeatedly have refused to discuss the administration of this law, but when Judge Ewin L. Davis, a member of the commission, had his attention called to the Babson statement he said, "Roger Babson is just guessing that the steel basing point system will be put out of business by the commission in its administration of the Robinson-Patman law, and his guess is no better than any other person's."

System Hasn't Been Discussed

It is understood on the very highest authority that the basing point system has never been before the membership of the commission in any of its discussions of the administration of the new act.

The attitude of this commission, of course, toward the whole basing point matter is no secret. It has always been against the system and probably always will be. However, it is known that the commission has no desire to get after this matter through a back door such as the new law. It would prefer to abolish this system in some "scientific manner."

It must be borne in mind that when the Robinson-Patman law was under discussion during the closing hours of the last congress, the abolition of the system was contained in an amendment in the house. There was considerable discussion of this. It definitely was agreed that this amendment should be killed and so it was. In the upper house, Senator Borah of Idaho and several other members asked if the amendment would be taken out of the bill before final passage. They were informed that it would be. If it had not been killed it is quite certain that the bill would not have passed congress. There was too much opposition to the abolition of the basing point system in both houses of congress.

Won't Abolish System

In view of all this, it does not seem possible that the federal trade commission, or any other commission, would try and read into this act anything that would allow them to abolish the system as a whole. It is quite certain, should this be done that any court ruling on its constitutionality would go back into congressional floor discussions.

It is quite possible, it has been pointed out at the commission, that in a case involving some steel manufacturer the latter might be cited and a formal complaint issued, and that the commission might give the basing point as a cause for discrimination.

Should this occur, however, it is quite clear that it would not militate against the system as a whole but simply in the one individual case. It has been stated officially many times at the commission in connection with the administration of this act that each case is to stand on its own bottom.

SUPREME COURT OPENS TODAY; NEW DEAL LAWS UP

With the fall term of the Supreme Court beginning Oct. 5, a number of cases involving New Deal legislation come to the fore. In addition to the cases now on the docket, others involving similar legislation are on their way up to the court and will doubtless be argued and ruled on before adjournment next June.

Included in some of the interesting cases now on the docket is the national labor relations act, the railroad labor act, public utility holding company act, the Frazier-Lemke farm mortgage act as amended, and the right of the government to lend money to establish competing municipal electric plants.

Some of the other cases also pending include the New York and North Carolina mortgage moratorium laws, the joint resolution against shipment of arms and munitions, the gold clause resolution, the silver purchase act, the New York state unemployment insurance act, the securities act of 1933, the economy act, and the Washington state minimum wage law. There are many other cases pending but these include most of the general state and federal government cases about which there will be the greatest interest.

STEEL OFFICIALS CALLED BUT NOT HEARD BY COMMITTEE

The Lafollette subcommittee on civil liberties has adjourned until after the election after about a week of hearings. Officials in charge of this investigation do not know yet whether sessions will be held in November or December. However, it is definitely announced that the committee will not meet until after election.

In connection with the hearings already held, it is interesting to note

that certain steel officials were asked to come to Washington to testify. They waited around here for several days and finally were allowed to leave without ever reaching the stand. They will be called later, it is said.

There was a definite rumor here during the course of the hearings that officials of the Bethlehem Steel Co. had been asked to testify. This story evidently grew out of the fact that one member of the committee said that he thought that officials of the company would be asked to go on the stand. No date for such witnesses has been set.

CHAMBER CRITICIZES NEW WALSH-HEALEY RULES

Mumblings and grumblings have been heard frequently from various industrial interests during the past week relative to the Walsh-Healey government contract law which became effective Sept. 28, but none of them has been more severe than those from the United States chamber of commerce.

The chamber points out that the recently issued regulations "go beyond the provisions of the law in regard to the contracts affected."

"In the law as finally enacted," says the chamber, "there is provision for exemption of contracts for articles and materials which are usually purchased in the open market. The understanding shown by congressional debates was that there was exemption from the special labor provisions of the act in the case of all contracts for articles which are normally sold from the shelf or from stock.

"The regulations undertake to defeat any such intention by construing the provision not as describing the kinds of things which may be purchased by government officials without contractors being bound by the labor stipulations, but as relating solely to the existing statutory authority permitting government departments to make purchases without advertising for bids. The ordinary statutory authority for buying without bids is limited to small amounts."

EMBASSY NOW DEFENDS PRESENT SPANISH LEADERS

Propaganda is now being disseminated by the Spanish embassy in this city in favor of the present Spanish government. This is only since the resignation of the Spanish minister and his aids who favored the so-called rebels.

In one of the latest statements the embassy takes up the question of the seizure of foreign owned property.

"The Spanish government has repeatedly announced to the world that no misgivings should be entertained with reference to foreign property holdings in Spain," says the statement.

"Due to the immediate requirements of fighting the rebellion, it has been necessary to temporarily confiscate some foreign plants. But, in doing so, the action has not represented in any manner an expropriation."

In this same connection the embassy discusses at some length the strong financial status of the government, stating that it holds fourth place in the nations holding gold following only the United States, Great Britain and France.

NEW BUREAU FAVORED, BUT COST IS OBSTACLE

Suggestions for the 1937 fiscal year budget for the department of commerce will be sent to the bureau of the budget in a few days. The latter part of this month hearings will be held on it by the budget bureau.

Included in the appropriations will be an item for a proposed new bureau of industrial economics in the department of commerce. At one time it was understood that Secretary Roper contemplated asking for $1,000,000 for this new work but it is said that now his request will be less than half that amount.

There are some interesting stories in the corridors of the department of commerce these days about this proposed new work. The matter had been broached to various members of the Roper business advisory council in an informal way and many had shown interest in it.

However, when the matter was put up to the council at a recent meeting, while considerable interest was shown in the proposed new work, members of the council thought it would be wise to go slow on any additional appropriations.

It was given out more or less officially that the council did not pass any formal resolution favoring this new division because if the budget bureau turned down the recommendation it might be embarrassing to the council.

On the contrary, however, the real story seems to be that the council refused to pass any formal resolution favoring the project because the majority of the members did not believe that any large additional appropriation should be asked for at this time. They wanted to help balance the budget. This does not mean, by any means, that the members of the council raised any violent opposition to the new division. They want to go slow and feel their way along even in this work.

In presenting the matter to his business council, Secretary Roper said:

"Can the department of commerce serve business needs by organizing in a proper way a unit or units within the department charged with the responsibility of pursuing study and research in the field of industrial economics? Is there a needed place for data so compiled in our present day business and industrial life? If so, how would you suggest such a program should be formulated for effective service without materially increasing the expenses of the department?

"The objective of this idea which is presented for your consideration would look to a similar service for business and industry in the department of commerce as that of the bureau of agricultural economics in the department of agriculture provides for agriculture."

RAIL CHARGES UPHELD

A decision in a case of the Laclede Steel Co. against the Louisville & Nashville railroad has been handed down by the interstate commerce commission in which the commission in its syllabus stated that "charges collected on steel bars and steel spiral columns, in straight or mixed carloads, from Madison, Ill., within the East St. Louis, Ill., switching district, to points in Kentucky, found applicable, excepting to Sonora. Applicable charges found not unreasonable or otherwise unlawful. Complaint dismissed."

BERRY ASKS PLAN OF ACTION AGAINST COURT

Manufacturers who refused to cooperate with Major George L. Berry in the formation of his so-called council for industrial progress are just beginning to see what they were spared. The major has now come through in a communication to the members urging them to prepare a definite program for future action in "the intolerable situation precipitated by the Supreme Court's interpretation of the law." This certainly seems to be going pretty far afield for any industrial council, but the major doesn't mind.

The major proposes a meeting of the council early in December and asks the members to "give much thought to the problem."

SWEDISH ORE EXPORTS ARE EVEN WITH 1929

Appreciable improvement in Sweden's iron ore export trade during the current year is indicated in a report to the commerce department.

Statistics made available by the Granesberg-Oxelosund company of Stockholm show that its foreign shipments in the first eight months of 1936 totaled 6,192,000 metric tons as compared with 4,109,000 metric tons during the same period of 1935. The 1936 eight-month total, the report shows, equals that of the record year 1929.

Editorial

Fate of Robinson-Patman Act Rests on Ability of FTC

ACCORDING to reports from Washington, the first formal complaint of price discrimination under the Robinson-Patman act will be announced soon. This initial case will be watched with interest by producers, sellers, distributors and buyers everywhere in the hope that it will furnish a clue as to how the federal trade commission will proceed in its administration of the law.

Almost without exception, those who have studied the act carefully believe that if it is upheld in the courts and if the commission charged with its administration desires to utilize its provisions to the utmost, it can be made an instrument for forcing radical changes in the existing production, manufacturing and distributing practices of industry. It is susceptible to broad application, and, while it was thrown together hurriedly in the last session of congress, it is distinctly more explicit—and certainly is endowed with sharper teeth—than Section 2 of the Clayton act of 1914, which it amends.

However, the two "ifs" in the preceding paragraph cannot be dismissed lightly. No one can predict how the courts will treat the various provisions of the act, but if the history of the nation's important anti-trust legislation can be accepted as a guide to possible future developments, then one can be reasonably sure that the Robinson-Patman bill will encounter difficulties at the bar of justice.

Experience with Anti-Trust Laws Has Failed To Clarify Status of Many Practices

The Sherman anti-trust act of 1890 has been in effect 46 years. Under its provisions, oil and tobacco combinations were dissolved in 1911. However, in prolonged litigation, United States Steel was able to defend itself successfully against the government's contention that it was a combination in restraint of trade. In spite of the numerous cases which have been tried under the Sherman act in almost a half-century, the dividing line between legal and illegal combinations still is hopelessly vague.

In most respects, the Clayton act also has been ineffective. In the 22 years of its existence, it presumably has prohibited price discrimination, exclusive selling or leasing contracts which prohibit the use of the goods of a competitor, intercorporate shareholding and interlocking directorates, when the effect may be to "substantially lessen competition or to create a monopoly." Certainly the act has fallen far short of successfully curbing these four prohibited practices.

Perhaps the most effective anti-trust legislation passed prior to 1936 was the federal trade commission act. Section 5 declares illegal "unfair methods of competition in commerce" and authorizes the commission to institute hearings and issue "cease and desist" orders. It may be argued that this provision has been more potent than the Sherman or Clayton acts in curbing prohibited practices.

But taking into consideration the general effect of all three acts, it must be admitted that they have contributed little to a clear-cut understanding of what is legal or illegal in competition. They have caused untold confusion, and certainly have failed to achieve the purpose of the legislators who sponsored them.

With this record of the past in mind, have we any reason to believe that the Robinson-Patman bill will fare any better than its predecessors? Is it not likely that real progress in prohibiting price discrimination will come about through the slow evolution of legislation and experience, in which the Robinson-Patman act, like the Sherman, Clayton and federal trade commission acts, will be but one of many factors contributing to that progress?

If FTC Repeats Mistakes of NRA, Act May Be Doomed Before It Has Fair Trial

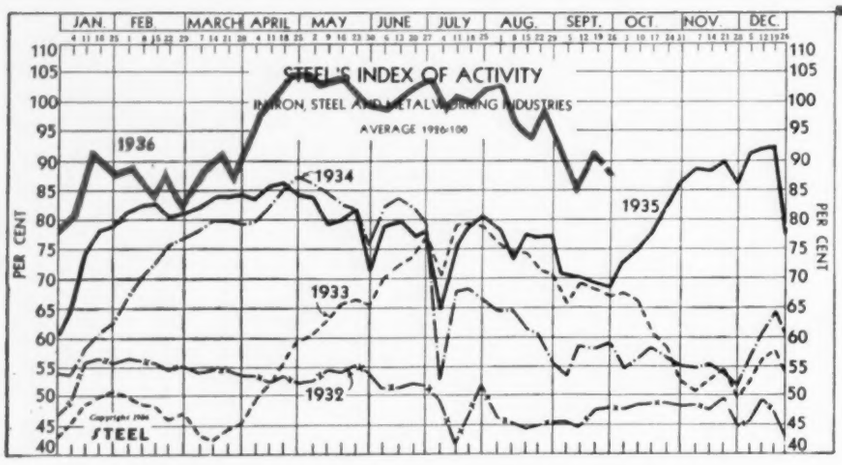
The second important "if" is concerned with the administration of the act. Will the federal trade commission go the limit in exhausting its broad potentialities or will it be content to deal only with the more glaring and more obvious practices of price discrimination?

This is an all-important question. If the commission acts in moderation and attempts honestly and sincerely to curb patent abuses, it may succeeed in winning public confidence to the extent it may be able to make the law really effective. On the other hand, if it chooses to repeat the mistakes of NRA—that is, to try to change everything overnight, to attempt to do too much, to bully and hamstring business and to otherwise make itself a nuisance to innocent and guilty alike—then it will make the law ineffective before it has received a fair test.

For these and other obvious reasons it is important that the early complaints under the Robinson-Patman act be handled tactfully and intelligently. As in the case of NRA, the success or failure of the law will depend as much upon the quality of its administration as upon the actual merit of its provisions of its text.

Probably the handling of the price discrimination act is the most important piece of work that has been assigned to the commission since it was established in 1914. It furnishes a fine opportunity and imposes a heavy responsibility which should challenge the five commissioners to put forth their best administrative efforts.

THE BUSINESS TREND



STEEL'S *index of activity in the iron, steel and metalworking industries declined* 4.1 *points to* 86.0 *in the week ending September* 26:

Week ending	1936	1935	1934	1933
July 11	100.9	76.5	67.8	79.1
July 18	99.9	79.8	68.1	79.4
July 25	102.1	80.8	66.4	78.8
Aug. 1	102.5	78.4	64.8	75.9
Aug. 8	98.7	73.4	64.6	74.7
Aug. 15	92.6	77.5	61.4	74.2
Aug. 22	97.7	77.0	60.3	71.6
Aug. 29	94.0	77.3	55.1	70.3
Sept. 5	87.5	70.9	53.5	65.5
Sept. 12	83.1	70.1	58.7	69.1
Sept. 19	90.1†	69.4	58.1	68.2
Sept. 26	86.0*	68.5	59.3	66.9

†Revised. *Preliminary.

The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

Signs Point to Greater Activity in Final Quarter

INDUSTRY enters the final quarter of 1936 with justifiable expectations for continued activity at high levels. Several important factors undoubtedly will act to lift the trend of business still higher before the end of the year.

Foremost among these will be the resumption of normal operations in the automobile industry. With the shows scheduled for November, production will be expanding weekly throughout all of October. The output of 15,680 cars in the week ending Sept. 26 probably marked the low point in the off-season.

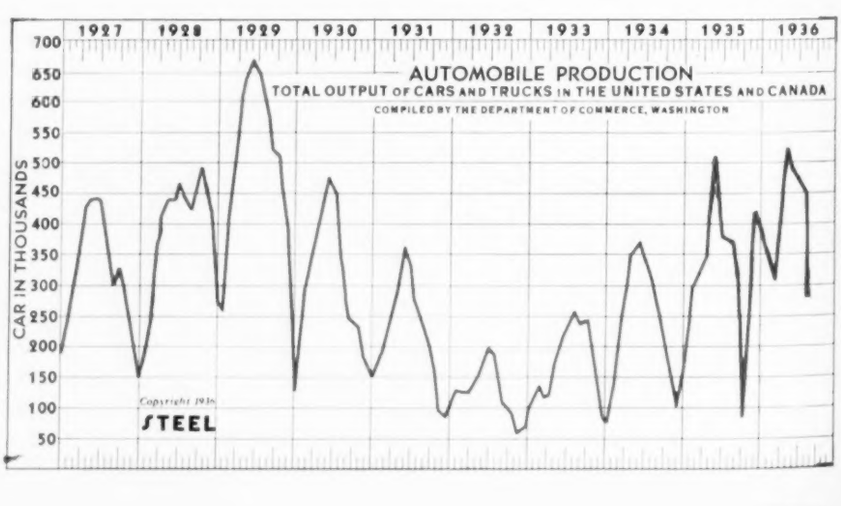
A second although more remote factor is the international money situation. During recent months the pending fate of the French franc and that of other currencies dependent upon gold contributed to an ill-concealed apprehension as to whether adjustment could be manipulated in an orderly manner. The French-Anglo-American agreement seems to have forestalled most of the threatened difficulty on this score and it appears that devaluation of the foreign currencies will be carried out with a minimum of confusion.

In the meantime, the gratifying climb of freight car loadings is giving substantial moral support to the increased buying program of the railroads. Traffic is mounting to within striking distance of 800,000 cars weekly—a figure that has not been recorded since November, 1930.

Steelworks operations are expanding moderately. The rate now is at the highest level touched this year and a continued brisk demand is indicated.

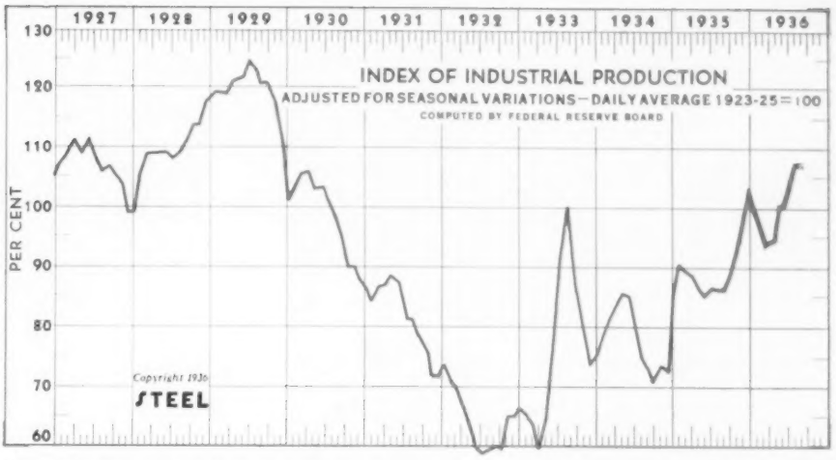
The outlook indicates that STEEL'S index of industrial activity—momentarily depressed to 86.0 by low automobile output—will rise through and beyond the nineties before the end of the month.

	1936	1935
January	377,306	300,325
February	300,874	350,345
March	438,945	447,888
April	527,726	477,059
May	480,571	381,809
June	470,887	372,085
July	451,474	345,178
August	275,951	245,092
September	.....	92,863
October	.....	280,356
November	.....	408,555
December	.....	418,303


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
AUTOMOBILE PRODUCTION
TOTAL OUTPUT OF CARS AND TRUCKS IN THE UNITED STATES AND CANADA
COMPILED BY THE DEPARTMENT OF COMMERCE, WASHINGTON
CAR IN THOUSANDS
STEEL

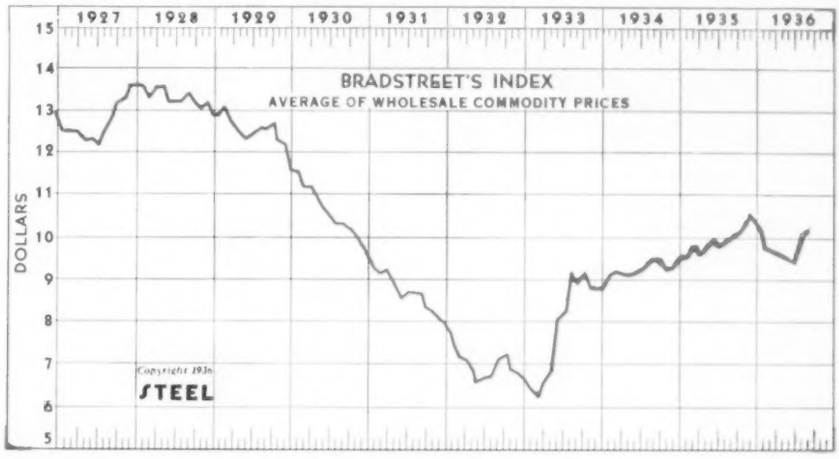
Industrial Production Index Unchanged in August

	1936	1935	1934	1933
January	98	91	78	65
February	94	89	81	64
March	93	88	84	60
April	100	86	85	67
May	101	85	86	77
June	103	86	84	91
July	107	86	75	100
August	107	87	73	91
September	..	89	71	84
October	..	95	73	77
November	..	98	74	73
December	..	104	86	75


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
INDEX OF INDUSTRIAL PRODUCTION
ADJUSTED FOR SEASONAL VARIATIONS—DAILY AVERAGE 1923-25=100
COMPUTED BY FEDERAL RESERVE BOARD
PER CENT
130 120 110 100 90 80 70 60
Copyright 1936
STEEL

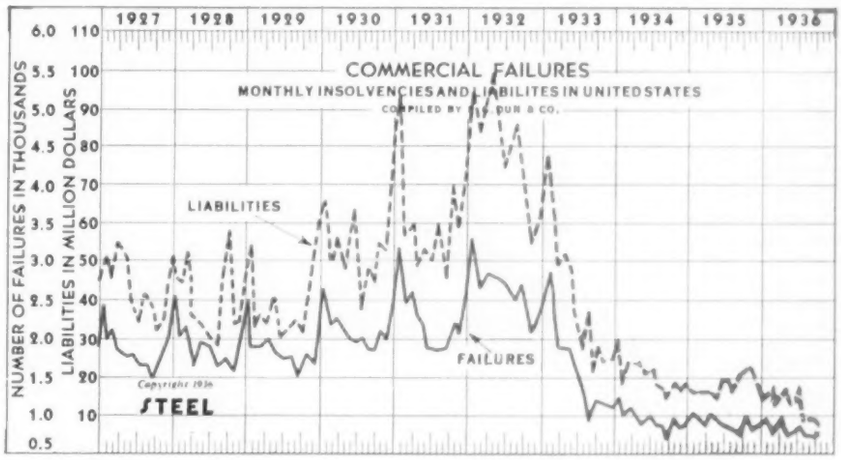
Bradstreet's Price Index Registers Slight Gain

	1936	1935	1934	1933
Jan. 1	$10.36	$9.49	$9.01	$6.53
Feb. 1	10.02	9.78	9.26	6.53
Mar. 1	9.92	9.79	9.17	6.54
Apr. 1	9.85	9.66	9.16	6.98
May 1	9.81	9.79	9.14	8.02
June 1	9.73	9.90	9.24	8.34
July 1	9.85	9.84	9.32	9.01
Aug. 1	10.14	9.91	9.48	8.99
Sept. 1	10.19	10.00	9.45	9.05
Oct. 1	.....	10.17	9.27	8.84
Nov. 1	.....	10.28	9.29	8.81
Dec. 1	.....	10.40	9.49	8.83


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
BRADSTREET'S INDEX
AVERAGE OF WHOLESALE COMMODITY PRICES
DOLLARS
15 14 13 12 11 10 9 8 7 6 5
Copyright 1936
STEEL

August Business Failures Up Slightly; Liabilities Drop

	Failures, Number		Liabilities, Dollars (000 omitted)	
	1936	1935	1936	1935
Jan.	1,077	1,146	$18,104	$14,603
Feb.	856	956	14,089	15,217
March	946	940	16,271	15,361
April	830	1,083	14,157	16,529
May	832	1,004	15,375	14,339
June	773	944	9,177	12,918
July	639	902	9,904	16,523
Aug.	655	884	8,271	13,266
Sept.	...	787	.....	17,002
Oct.	...	1,056	.....	17,185
Nov.	...	898	.....	14,384
Dec.	...	910	.....	15,686


1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
COMMERCIAL FAILURES
MONTHLY INSOLVENCIES AND LIABILITES IN UNITED STATES
COMPILED BY R. G. DUN & CO.
NUMBER OF FAILURES IN THOUSANDS
LIABILITIES IN MILLION DOLLARS
6.0 5.5 5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5 1.0 0.5
110 100 90 80 70 60 50 40 30 20 10
LIABILITIES
FAILURES
Copyright 1936
STEEL

Building Awards Continue Upward in August

	Square Feet		
	1936	1935	1934
Jan.	27,053,300	11,245,100	9,568,700
Feb.	20,856,700	9,670,300	8,176,300
Mar.	31,308,100	15,845,300	14,788,900
Apr.	37,490,200	19,917,300	14,207,100
May	36,362,700	22,276,200	14,664,400
June	36,883,900	22,878,800	13,986,500
July	38,762,500	21,565,900	13,250,000
Aug.	40,285,100	21,545,400	14,259,000
Sept.	.....	21,365,700	12,510,300
Oct.	.....	27,775,900	15,098,100
Nov.	.....	24,120,700	12,780,800
Dec.	.....	33,441,900	9,188,700

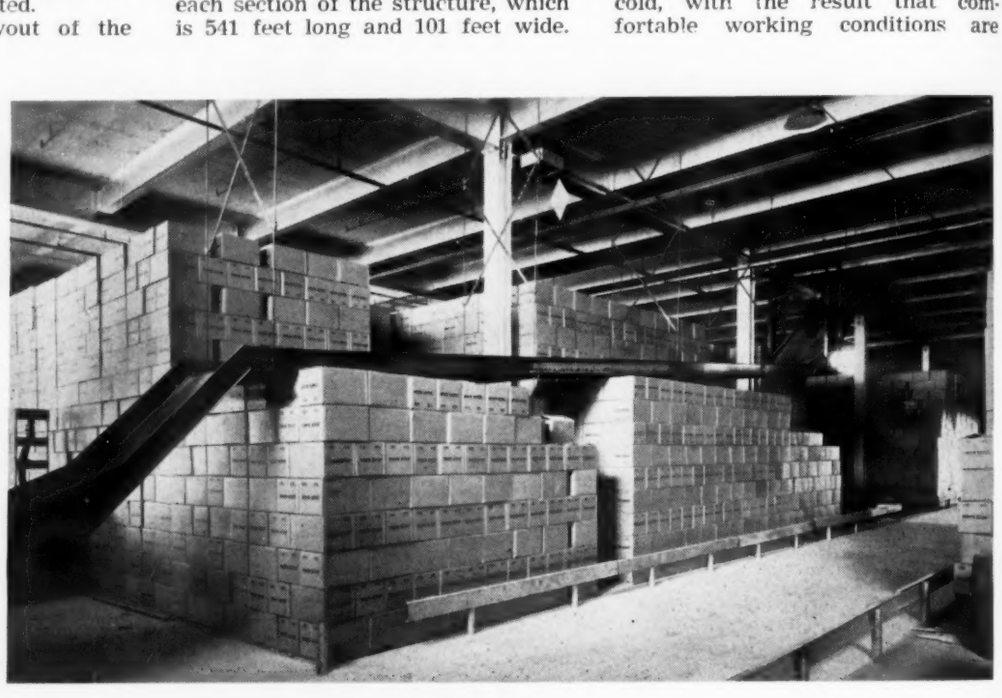
1927 1928 1929 1930 1931 1932 1933 1934 1935 1936
BUILDING CONSTRUCTION
CONTRACT AWARDS IN 37 STATES
COMPILED BY F. W. DODGE CORP.
MILLIONS OF SQUARE FEET
100 90 80 70 60 50 40 30 20 10
Copyright 1936
STEEL

Glass Block Fills Dual Need in New

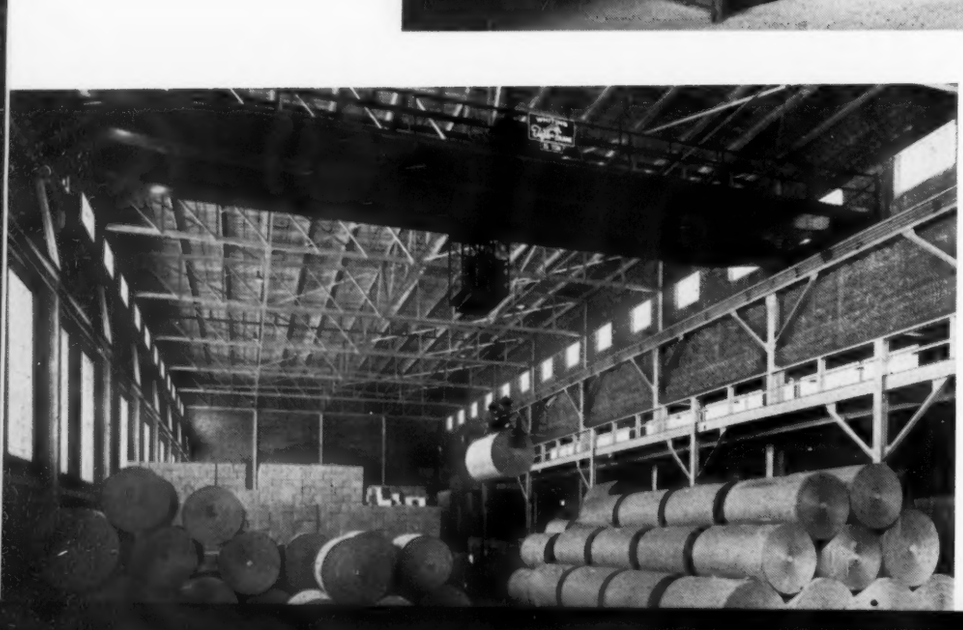
INDUSTRIES concerned with functional treatment of new plant buildings are noting the latest complete application of this principle in the corrugated container factory and warehouse recently completed for the Owens-Illinois Glass Co. at Gas City, Ind., where manufacture of prescription ware is concentrated.

Scientific interior layout of the building—one of the largest auxiliary units ever built for the glass industry—is reflected outside by the arrangement of more than 42,000 glass blocks in panels which translate the interior plan. Laid in horizontal panels which provide streamline detail, they meet specific illumination requirements in each section of the structure, which is 541 feet long and 101 feet wide.

Six hundred and ninety tons of steel have been used in the structure, which has been built by the Austin Co., Cleveland. It is of steel frame and brick construction, with glass block supplanting windows. The block allows 87 per cent light penetration and acts as insulation against summer heat and winter cold, with the result that comfortable working conditions are easily and economically maintained throughout the plant.



AISLES in the storage bays (right) are protected by steel guardrails, are wide enough for two-way traffic. Gravity conveyors carry finished products to the shipping dock. Roll storage area in the plant (below) is served by a 5-ton electric crane. Horizontal panels of glass block beyond the balcony provide daylight illumination



It has been built to accommodate large stores of roll paper and the fabrication of this material into corrugated board and cartons for packing glass containers. Straight-line facilities carry through the four functions of the building; Paper handling and storage; corrugated board and box manufacture; warehousing and shipping.

While the layout and plan of the structure sets high standards of efficiency in box production and handling, the distinguishing feature of this combined manufacturing

Container Plant

GLASS block in three shafts above the entrance to the plant serves a functional purpose during the day and an ornamental purpose at night

and storage building has been its application of functional design to suit specific operating purposes. Notwithstanding the fact that the owner is also the manufacturer of glass block, panels have been restricted to the sizes justified by their location and function.

The eight large horizontal panels extending along the 541-foot east wall have become the distinguishing architectural feature of the building, but their presence was dictated by the need for abundant, glareless daylight along the corrugating and box production line laid out along this wall. These panels, 61 feet 5 inches wide and 8 feet 7 inches high, are the largest independent exterior sections to be constructed of glass block, not excepting the new Owens-Illinois office and laboratory building at Toledo, O. A lower course of small horizontal panels, 7 feet, 6 inches by 3 feet, 4 inches at ceiling height on east and west walls of the bottle storage area, is in keeping with the needs of this department, while three towering shafts of glass block ornament the entrance on the north with appropriate dignity, and furnish the necessary illumination for stairways and elevator lobbies.

No Lack of Light

Light filters into the roll storage room from the west through eighteen tall cathedral-like panels, 12 feet 10 inches by 3 feet 6 inches set midway between the floor and roof trusses, and a second course of small horizontal panels admits more light from a higher point midway between the bottom chord of the roof trusses and the crane rail on the east and west walls.

All glass block was laid in brick mortar, somewhat richer than commonly used for ordinary brick. A galvanized 2-inch reinforcing mesh was set in the mortar at every third course and each of the glass block panels has been caulked on top and sides with oakum and sealed inside and outside with a mastic joint.

A 4-inch layer of glass wool, high in insulating and sound absorption qualities, lies underneath the roof deck in the manufacturing area and is supported by light weight metal lath. The roof deck is entirely of 2-inch yellow pine with bonded waterproofing.

Since no provision was made for wall ventilation, a controlled system for circulation and air-conditioning has been installed. Skylights and ventilators are used in conjunction with a system of automatic controls.

Roll paper delivered by freight cars to a siding installed along the west side of the building is unloaded into the roll storage area which occupies the south end of the building. With the aid of a 5-ton electric traveling crane, the rolls are placed in sections designated for paper of each given weight and quality. As many as 1250 rolls of 72-inch width, weighing 2 tons each, can be stored in this area at one time, and a special reinforced concrete floor slab, tested for a load of 3000 pounds per square foot, has been provided. The room is also equipped with roll stops and the walls are reinforced with heavy steel beams for lateral thrust. Each of these members is set vertically and is anchored to two 1 x 18-inch anchor bolts and riveted to a spandrel beam which stands 12 feet above the floor level.

The roll storage room, 204 feet long and 72 feet wide, has no intermediate columns and is spanned by welded steel trusses completely fabricated in the Austin company's Cleveland shops. The crane operates over this entire area on crane rails set 37 feet above the floor, and transfers rolls from storage to the production line over a 10-foot second-story balcony, ex-

(*Please turn to Page* 61)

SUPERINTENDENT of the plant has a four-way view from this office, set in the heart of the building. Glass block partitions are set on three sides, with clear glass windows in all four sides

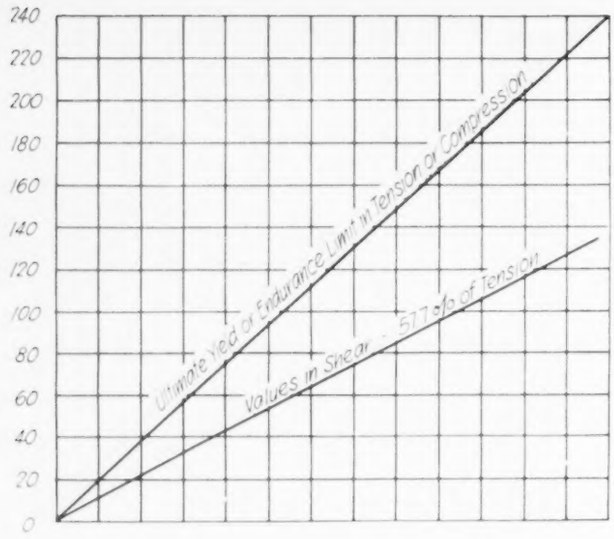


FIG. 1 — Relation between strength of treated or untreated carbon or alloy steel in compression and shear to strength in tension

Determining the Relationship Unit Load Rating

BY C. B. CONNELL
Westinghouse Electric & Mfg. Co.

IN DESIGNING a special machine to do a specific job, the engineer must consider certain fundamentals regarding stress of the working parts. All working parts must be designed to safe working stresses. These values are determined by type of load imposed on each part as to magnitude and frequency, type of stress, whether bending, shear, compression or combined stress; consideration of shape of the particular part which may cause stress concentration and use of the proper stress concentration factor; relation of normal stresses to peak stresses; and strength of material available or best suited in relation to the limiting type of stress.

To determine the load imposed on each part, it is necessary to consider the work done by the machine, method and type of power supply and its connecting parts, relation of each part to the power supply and the work to be done. If the work is of a nature that impact loads are encountered, the load on each part must be calculated from the power to overcome the impact load.

Calculating the Load

If the source of supply is of a nature to cause high torques, the load must be calculated in relation of the particular part of the machine to the power supply and work to be done. A specially-designed machine, therefore must contain an inbuilt service and application factor to enable the machine to do the work for which it is intended. The source of power supply is usually called the prime mover.

Having determined the loads which are to be the basis of design, stresses are calculated and their nature determined. Calculation of stresses from a load of known extent and type is, in a great many cases, a point on which opinions may vary. There are different methods of determining the equivalent stress for combined stresses and also for computing the exact degree of stress induced by a variable load imposed upon a steady load. After the stresses are determined, it is necessary to consider the type of load in order to determine intelligently what stresses may be allowed.

Types of loads are: 1. Steady loads; 2. shock loads; 3. alternate loads; and 4. combination of the foregoing.

The stress in any particular machine part as calculated from any one of the foregoing loads may be either a tensile, compressive, shear or combined stress, depending upon location and direction of the load, shape of the part and the method of supporting the part. Textbooks on machine design or strength of materials give the kind of stress and methods of calculating the maximum equivalent single stress for cases of combined stress.

Even if we assume that each of the different types of load described results in the same kind of a stress, say tensile, their nature is such that the limiting stress for each should be based on entirely different properties of the material. For instance, for steady or shock loads, allowable design stress should be based on the yield point of the material. For alternate or variable loads, the allowable design stress should be based on the endurance limit of the material. For a combination of steady load with a superimposed variable load, allowable design stress must be based on both yield point and endurance limit.

Properties of Materials

Establishment of an allowable design stress must be based on strength of the material. Physical properties of materials obtained through test which are used as criteria of their ability to withstand different kinds of loads are: Ultimate strength, yield point, reduction of area, elongation, hardness, impact value, and endurance limit.

These properties are generally given in tension, but there is a definite relation between the physical properties in tension, compression

THE accompanying article constitutes a paper presented at the nineteenth semiannual meeting of the American Gear Manufacturers' association aboard the S. S. SEE-ANDBEE on the Great Lakes, Sept. 8-10. The author, C. B. Connell, is application engineer, Nuttall works, Westinghouse Electric & Mfg. Co., Pittsburgh.

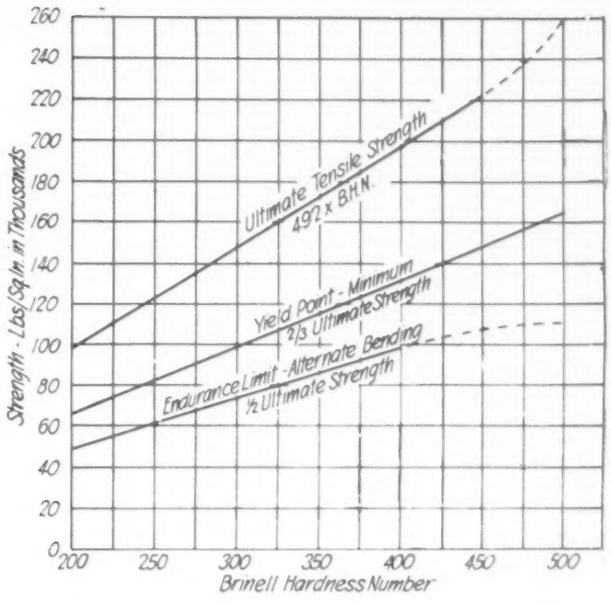


FIG. 3—Average physical properties for heat treated carbon steel — 1-inch rounds. Ultimate strength and endurance limit for alloy steels same as for carbon steels. For alloy steels 75 per cent is a good approximation for the yield point

Between Gear and Design Stresses

and shear for material strengths. In the case of shear, it is known that the values are 57.7 per cent of those in tension. This figure is obtained from the Von-Mises Henky shear-energy theory which has been amply substantiated by test. No conclusive proof is available for the relation between tension and compressive values, but for the purpose of design we may safely assume that the strength of iron or steel in compression is the same as that in tension. Figs. 1, 2 and 3 show the physical properties of several materials and their relations to each other.

In the list of properties of materials was included reduction of area, elongation and impact strength, because they are commonly given when the physical properties of any materials are determined. These are of little value to designers for they are no criteria of the stresses which the material is capable of withstanding, although, they are commonly used as indications of the toughness, ductility or ability to withstand shock loads. Their exact value, except from a comparative standpoint, is not known. For instance, crankshafts for one of the popular automobiles now are made of pearlitic malleable cast iron having low values of these properties when compared with steel, yet are called upon to withstand shock loads and repetitive stresses of a high order.

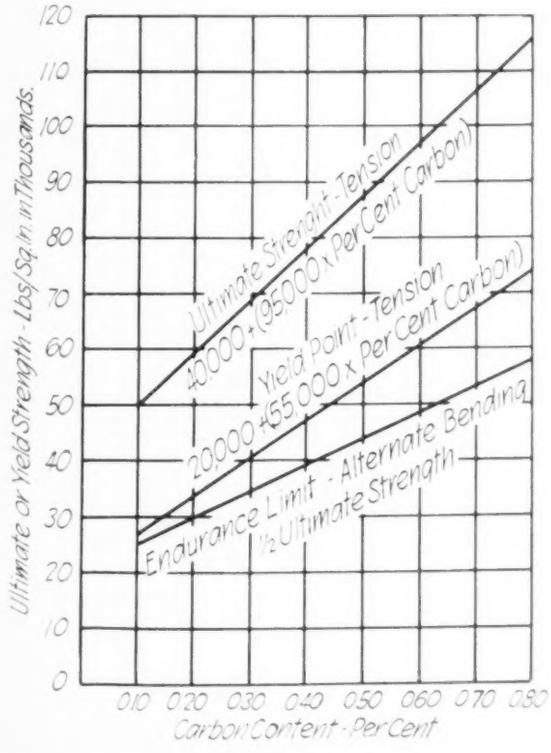

Ultimate or Yield Strength - Lbs/Sq.In. in Thousands
Carbon Content - Per Cent
Ultimate Strength - Tension
40,000+(95,000 x Per Cent Carbon)
Yield Point - Tension
20,000+55,000 x Per Cent Carbon)
Endurance Limit - Alternate Bending
½ Ultimate Strength

FIG. 2 — Approximate physical properties for forged or hot-rolled carbon steel normalized — manganese 0.40 to 0.80 per cent. Values for steel as received or as annealed will have a similar ultimate strength although yield strength, particularly for material as received, will vary considerably

Must Preclude Failure

Physical property values obtained through test naturally represent the loads at which failure will occur. The stresses corresponding to these loads represent the maximums and therefore cannot be used for allowable design stresses for no one would design or buy a machine that would fail when subjected to its maximum calculated load. Therefore, it is necessary to establish allowable design stresses which will preclude failure. The logical basis for the allowable design stresses is the strength of the material which is indicated by the physical properties modified by a "safety factor".

There are several considerations governing the selection of a suitable factor for modifying the strength of the material to obtain allowable design stresses. One is the fact that

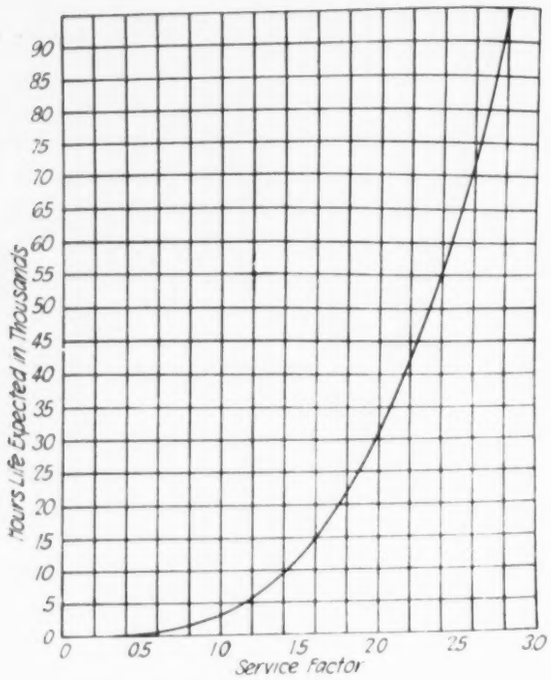


FIG. 4—Typical curve illustrating effect which speed reducer life factor or service factor has on life of an antifriction bearing

it is impossible to calculate the exact stresses in any machine part, particularly in the cases of combined stresses or complicated shapes. Then there are unavoidable variations in strength of the materials. There are also stress concentration effects due to fillets, notches, keyways, finish, etc., which actually increase the stress as calculated by conventional methods when the part in question is subjected to a repetitive or variable load.

Theoretically, the modifying factor should be different for each type of load and kind of stress and an exact knowledge of the conditions will often allow a suitable and proper selection of individual factors. This is seldom the case and conventional practice is to use a factor of 2 for stresses based on the yield point, and 3 for stresses based on the endurance limit.

Choosing the Right Factor

Maximum allowable design stresses, therefore, are obtained by dividing the strength of material values as shown by test by 2 or 3. Then, for a steady load, allowable design stress becomes half of the yield strength. For a shock load, the magnitude of which is known, two may be used, but if unknown, the factor may vary anywhere from 3 to 6. Shock loads due to the design of power transmission apparatus are rare. In most cases, shock loads are due to the driven apparatus, in which case they are cared for by application factors. For a variable or reversing load, allowable design stress becomes one-third of the endurance limit. When maximum load has been established, a design based on that and the allowable design stresses obtained as shown will have a factor of safety, or more properly, a "factor of ignorance" for caring for unknown or incalculable contingencies.

Of course, when the exact loads are unknown, it is necessary to use an application factor for derating any machine designed and rated in accordance with the foregoing procedure.

The essential requirement in the satisfactory selection of a standard machine from a manufacturer's catalog rating table is the relation of catalog ratings and application factors to design stresses. Regardless of whether the equipment to be selected be a motor, coupling, bearing or speed reducer, proper selection requires correct relation of rating to design stresses.

Any cataloged equipment has a definite basis of design and all parts are designed with a service factor to enable the machine to do the work as represented by the catalog rating table. A general-purpose induction-type motor, for instance, is designed to deliver continuously its rated horsepower within the guaranteed temperature rise. It has a certain torque and overhead capacity and can be selected safely from the manufacturer's catalog for its classified purposes. If the motor selected is inadequate for the application, the motor will heat up, thereby giving an outward indication of distress. It follows, therefore, that the limiting feature of design of a motor is its thermal rating. The mechanical design of a motor is based on the loads allowed by the maximum allowable temperature rise.

A speed reducer, like a coupling, is in a class entirely different from a motor. The motor is a prime mover designed to deliver a definite horsepower, whereas a speed reducer operates between the prime mover and the driven equipment and cannot divorce itself from the inherent characteristics of the power supply, couplings, and the driven equipment.

No Sign of Distress

The prime mover, because of its relation to the general equipment, when overloaded will either refuse to work or give an outward indication of distress. The speed reducer, due to design limitations and its position in the general scheme of equipment, will sometimes continue to work itself to destruction before giving an outward indication of distress. Certain types of electric motors may, due to design characteristics, locations, type of load, etc., operate for weeks and months under overloaded conditions.

Overloaded speed reducers improperly selected from a manufacturer's catalog rating table, due to design characteristics at a particular output speed and ratio dependent on the prime mover and the driven equipment or a combination of both the prime mover and the driven equipment, may fail in a short period of time. Therefore, the speed reducer seems to be a suitable subject to analyze as regards catalog ratings and application factors.

Speed reducer catalog ratings for a given unit reflect capacities of gears, shafts, and bearings at several different input speeds and ratios, all in one frame with a thermal capacity limited for each unit

Table I

A. G. M. A. Adopted Rating for Speed Reducers

Character of Load on Driven Machine	Electric Motor			Multicylinder Gas or Steam Engine or Turbine			Single-cylinder Gas Engine		
	Intermittent, 3 hrs.	8-10 hours per day	24 hrs.	Intermittent, 3 hrs.	8-10 hours per day	24 hrs.	Intermittent, 3 hrs.	8-10 hours per day	24 hrs.
Uniform	0.80	1.00	1.25	1.00	1.25	1.50	1.25	1.50	1.75
Moderate Shock	1.00	1.25	1.50	1.25	1.50	1.75	1.50	1.75	2.00
Heavy Shock...	1.50	1.75	2.00	1.75	2.00	2.25	2.00	2.25	2.50

size, regardless of the capacity of the gears, shafts and bearings. The basis of the catalog load rating in some cases is limited by the gears, some shafts, and some bearings, but all parts must be designed to stresses to give a reasonable life with proper maintenance and proper lubrication. In some cases load rating may be based on thermal capacity, but in most cases the load rating is based on mechanical strength.

Life of a speed reducer based on mechanical strength is dependent upon the stress imposed on the working parts. Mechanical working parts subjected to a certain working stress may operate indefinitely; the same parts subjected to a higher stress may operate a satisfactory length of time or may fail in a few weeks or months, depending upon the working stress in relation to the ultimate strength of the material.

The speed reducer catalog rating is based on the principle that the speed reducer is a mechanical means of transmitting a uniform flow of power between the prime mover and the driven equipment. Any speed reducer bearing the A. G. M. A. (American Gear Manufacturers' Association) nameplate must be designed to safe working stresses which contain an inbuilt service factor to deliver a uniform flow of power as measured by the rating of the speed reducer with occasional and momentary overloads of 100 per cent and any deviations from this principle require the use of application factors.

Factors Are Defined

Use of the terms service factors and application factors as used here will be understood as follows: Service factor as the relation between safe working stress and strength of the material; and application factor as the relation between catalog load rating and actual load imposed on the speed reducer.

Much work has been done on application factors for equipment with a catalog rating, notably by some of the antifriction bearing companies, in which the expected bearing life is plotted against the life factor or service factor. Fig. 4 is a typical curve which illustrates the effect the life factor or service factor has on the life of a bearing.

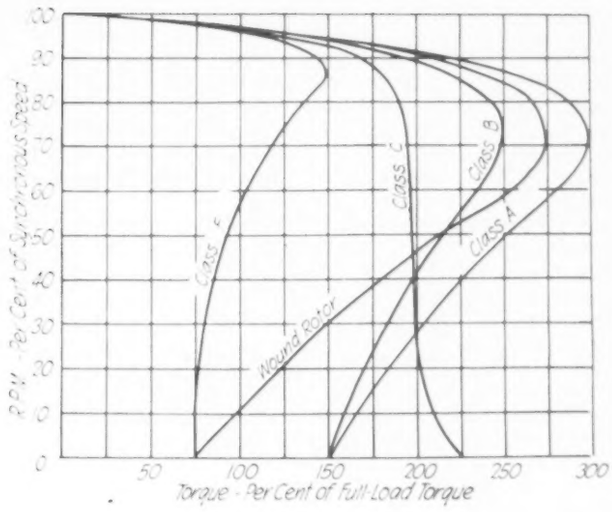


FIG. 5 — Speed-torque curves for different types of induction motors

A. G. M. A. practice of rating speed reducers has not established definite life values; the rating practice is based on a satisfactory life determined by experience. It is hoped, with the results of further research and tests, to arrive at life values in relation to imposed loads.

The speed reducer manufacturer publishes this list of application factors and instructions for their use in the selection of speed reducers. If the types of driven equipment and prime mover are considered in relation to the recommended application factors, the proper unit may be selected for any application except some few where the operating conditions are so severe it is necessary to refer the application to the manufacturer.

Any speed reducer designed to A. G. M. A. adopted rating practice, Table I, assumes for the catalog ratings an application factor of "1" at 8 or 10 hours operation per day. Coupled with the basis of rating has been an attempt to classify typical speed reducer applications under three classes of load; namely, uniform load, moderate shock load, and heavy shock load; and then assume three classes of power sources, such as motors, multicylinder gas or steam engines, and single cylinder gas engines. The evaluation of the application factor takes into account the connected load with the prime mover and the length of daily service which the reducer is supposed to operate, ranging from intermittent service (reaching a maximum of 3 hours per day) to average daily operation of 8 to 10 hours, and finally, continuous duty, or 24 hours a day service.

The driven equipment must be considered in relation to the speed reducer, prime mover and couplings. Some types of driven equipment impose an overload on the speed reducer which may be of a repetitive nature, occurring quite frequently, or an overload for a short period of time. The magnitude of the repetitive overload must be calculated or assumed and cared for by the application factor and by the selection of a proper type of flexible coupling.

Overloads imposed by certain types of pumps or similar operating driven equipment can be materially reduced or entirely eliminated by the proper type flexible coupling.

Capacity for Overload

Overloads imposed on speed reducers by the driven equipment, which are of any duration of time and occurring a number of times a day, must be cared for by the selection of a speed reducer with capacity to operate continuously at the peak loads. Some types of lobe blowers impose an overload on the speed reducer for a period of approximately 10 minutes and may occur several times an hour.

Some types of driven equipment, due to characteristics in design and operation, impose an overload on the speed reducer parts which is carried directly and proportionately reflected in the normal rating of the prime mover. For illustration, consider a speed reducer driving a conveyor, the prime mover being an electric motor, the speed reducer being connected to the conveyor by means of a chain and sprocket.

If the conveyor is uniformly load-

Table II

Back Lash and Deflection in Flexible Couplings

Test No.	Initial backlash, inches	Radius at working parts, inches	Deflection, in degrees	Deflection at working parts, inches
1	None	2.4687	1.30	0.0556
2	None	3.1250	0.50	0.0280
3	0.0125	1.9375	0.38	0.0122

ed and fed, the chain drive being set at proper tension, the stress in the speed reducer will remain constant throughout the duty cycle. If the conveyor load is overhauling and the chain drive is loose, the stress in the speed reducer parts will be made up of the load imposed by the inertia of the connected parts which act similar to a flywheel, plus the motor torque. This means the speed reducer parts if selected for uniform load conditions, would be overstressed on each recurrence of taking up the slack in the chain, although the torque of the motor may not exceed the normal rating. If the actual load and not the rating of the prime mover is known, the actual load is used in selecting the speed reducer. Sometimes the speed reducer may be over-powered due to some standardization policy or the prime mover may be over-rated.

As the driven equipment may have characteristics which over-stress the speed reducer parts, such as impact loads, surges, unbalanced overhung loads, and reversing service, all of these conditions have to be considered in the selection of the proper application factor.

Coupling Is Important

Type of coupling employed between the prime mover and the speed reducer, and the speed reducer and the driven equipment, is a more important factor in successful operation of a speed reducer than is generally recognized. Some speed reducer applications will operate successfully with any type or make of coupling. Other speed reducer applications require selection of a coupling of particular characteristics either between prime mover and speed reducer or between speed reducer and driven equipment.

Couplings, aside from the rigid flange type, are in general intended to compensate for the usual errors in misalignment in the connected shafts to allow free lateral end float to the connected shafts and to protect the driving equipment from shocks. Misalignment introduces bending stresses in the shafts and excessive bearing loads; shock load introduces excessive stresses in all parts.

While all types of flexible couplings on the market include, to some degree, the misalignment feature, some include to some degree the torsional flexibility feature. Design principles of some couplings permits a higher degree of misalignment than others; some permit a higher degree of torsional flexibility than others; some involve more initial backlash than others; while some design principles do not introduce any initial backlash.

The misalignment feature in flexible couplings is attained in different ways; some by the sliding action of the connected members, and others by a flexible element between the connected members.

Following are some of the design principles as used by the different coupling manufacturers and the claims made by the exponent of each principle. The pin type coupling employs a rubber bushing as the flexible element. The couplings using this principle have a reasonable amount of torsional and misalignment flexibility and do not, as a rule, have any initial backlash. Other types employ the use of a flexible element located between interlocking jaws of each coupling member and have a reasonable amount of torsional and misalignment flexibility and have no initial backlash.

Other types employ the use of springs between the coupling members and have a high degree of torsional flexibility and a reasonable amount of misalignment flexibility and do not, as a rule, have any initial backlash.

Some types employ use of interlocking steel teeth similar to gear teeth between the coupling members, resulting in a high degree of misalignment flexibility and greater strength. This type of coupling has some initial backlash, but no great torsional flexibility.

Still other types employ the disk principle between the coupling halves. Some manufacturers use disks of flexible material and obtain a reasonable amount of torsional flexibility in addition to the misalignment flexibility. Other manufacturers use laminated steel disks and obtain a high degree of misalignment flexibility with greater strength. Couplings employing the disk principle do not have any initial backlash or torsional flexibility.

Tests Made on Couplings

Table II shows back lash and deflection of several couplings obtained by static deflection tests. The couplings were approved by the coupling manufacturers for a specific application and, therefore, should be on a comparable basis. Test No. 1 was made on a coupling employing the spring type flexible element. Test No. 2 was made on a coupling using the flexible element in compression between interlocking jaws of the coupling members. Test No. 3 was conducted on a coupling of the interlocking gear tooth type.

There is the possibility that the critical speed, or resonant speed, of the system will be near the operating speed, especially if the prime mover is a gas or oil engine. This condition can be corrected to some extent by use of a coupling that has

(*Please turn to Page* 66)

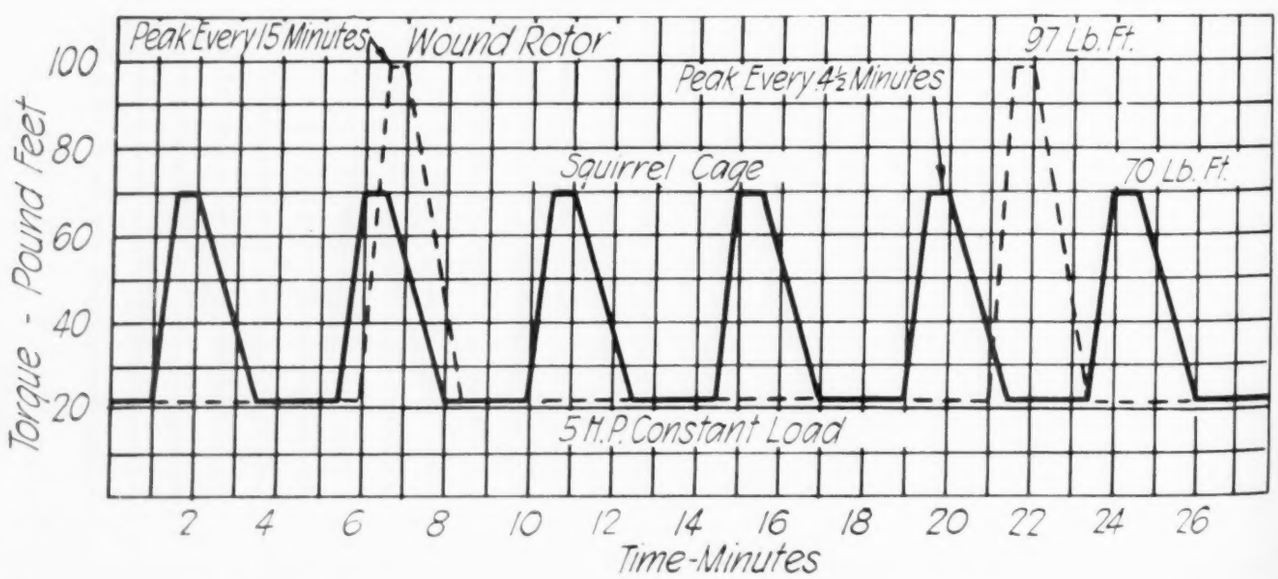
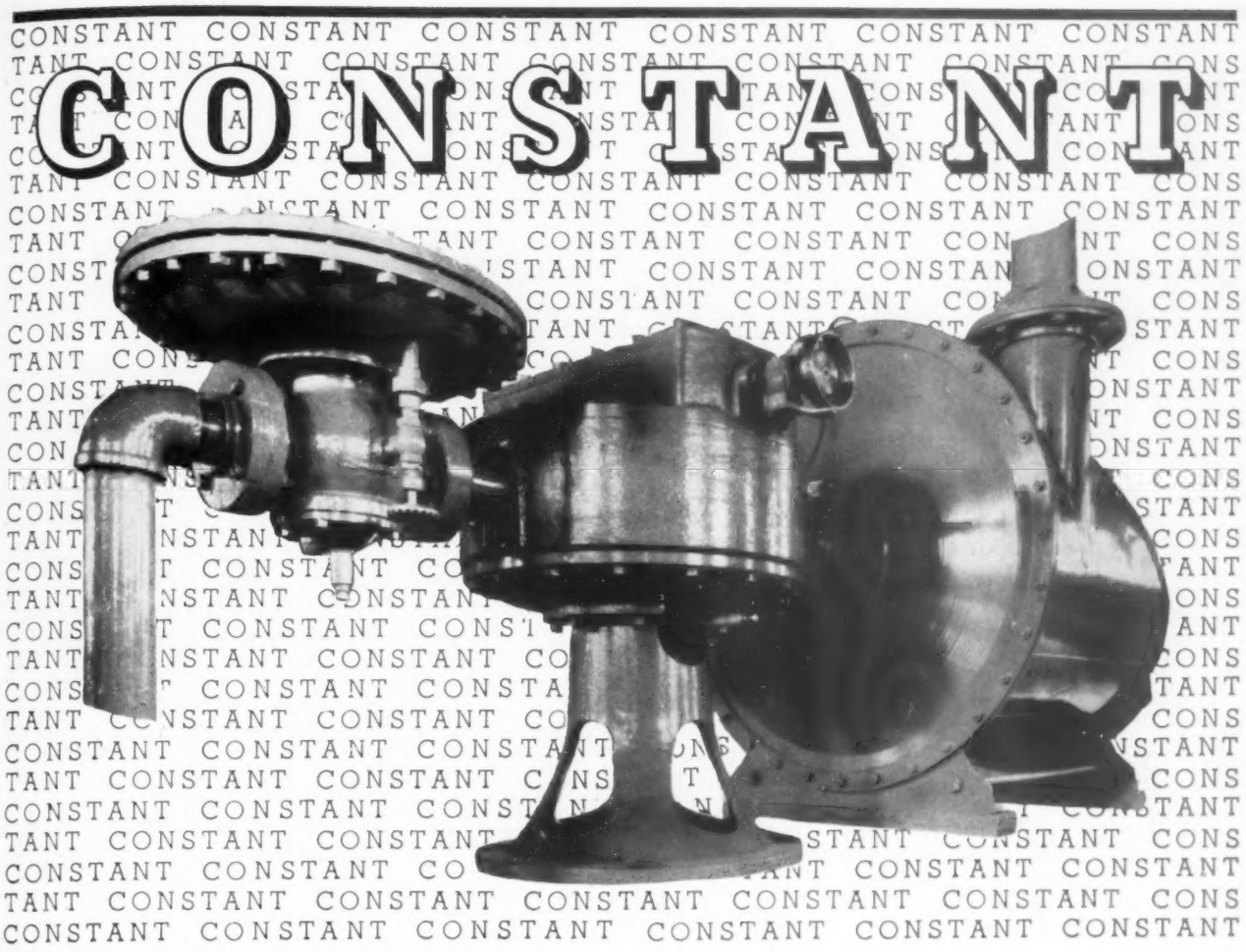


FIG. 6—An assumed extreme continuous-duty cycle for a speed reducer plotted from actual motor test performance curves



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POWER DRIVES

Versatility Is Required In Maintenance Personnel

TEMPERAMENTAL disposition of maintenance men is a factor which often is overlooked in their selection. Since the men engaged in servicing and maintaining electrical and mechanical equipment in a plant must contact and work with men in all other departments much of their success depends upon their ability to get along with all types of individuals, even under the most trying circumstances.

This does not mean that a maintenance man must be subservient. Such a man can do little in an emergency. He must be firm and determined, yet not unreasonable or arrogant. Above all such workers must be even-tempered, or at least able to control their tempers. Needless to add, but sometimes not the case, their department head should stand back of them in whatever they do. Therefore, it is to the supervisor's advantage to select men who will not overstep his instructions.

Of equal necessity are the characteristics of safety and reliability. Much of their work is performed alone, often where their carelessness is not only a hazard to themselves but often endangers others. Particularly is this true when working overhead or in leaving tripping hazards in aisles and around machines.

As the thoroughness of their work is seldom inspected or checked, except superficially, it is necessary that such men will do good, reliable work because of their pride in their own workmanship. Slighted work may not show up for months, and even then not in a way that the responsibility may be definitely traced to the man who shirked.

• • •

Grouping by Operator

IN PLANNING group drives, one important problem is to decide on the best size or number of machines to include in a group. A common practice has been to group all machines according to type and size, irrespective of the number.

There are two objections to this plan. One is that during times of slack production the entire group must operate even though only a few of the machines are required. Another is that as production approaches the peak some of the machines may be operated on a second shift before the entire plant goes on two shifts. In either case, with a large single group, several machines on the line may be idle. If the groups are small, production may be planned so as to carry all extra production on one or more groups.

For these reasons a mixed group of machines often has many advantages in that the group is in reality a "small shop" in itself and may be operated independently.

With automatic screw machines plant managers generally try to obtain better supervision and more specialized and experienced operation by grouping like machines together. A common tendency, however, is to build the groups too large, thus creating the same two objections previously mentioned.

One plant specializing in automatic screw machine work overcame these objections by arranging the groups of a size so that each group contained only the machines which could be handled by one man or one man with a helper. This made each group entirely self-contained, from an operating and production standpoint.

By carefully planning the work to the machines this arrangement provides maximum flexibility during periods of fluctuating production in that the groups may operate under any conditions without idle machines or partially idle operators.

• • •

Conveyor Belt Life

WHERE abrasive materials are discharged on a conveyor belt from the side often about one-half of the belt face is worn more than the other half. This is due to the greater impact of material on part of the surface.

Turning the belt end for end before the protective belt surface is worn entirely through presents the less worn section of the covering to the greater impact and so evens up the wear across the entire face of the belt. This practice, adopted in one coke plant, has been found to give longer and more satisfactory life than turning the belt over to present the traction face with its thinner protective coating to the abrasive impact. Also, turning the belt over presents an uneven tractive face to the drive pulleys.

• • •

Compact Drives Pay

AN automobile company using a turn-table or merry-go-round assembly for one of its unit parts found it necessary to make occasional changes in location with the plant changes whenever a new model was introduced or at times of general expansion. The motor and jackshaft to the turntable were ceiling mounted, driving a vertical shaft by bevel gearing with another bevel gear at the floor level to drive the turntable.

To take down and erect the overhead drive required about two days' labor for a small gang. When it was determined that the changes would likely become a regular item the drive was changed by mounting the motor and gear on a wooden platform which could be fastened to the floor.

• • •

Seldom is it wise to decide arbitrarily on all group drive or all individual drive. Production advantages, initial cost, maintenance requirements, power consumption and relation to other equipment should all be weighed carefully for each machine and group of machines before deciding on the type of drive. Generally the best arrangement includes drives of both types.

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Tags of different colors are used in one plant to identify bearings requiring lubricating at different periods or frequencies. Red, naturally, is used for bearings which must be serviced daily. Other easily distinguished colors indicate weekly, monthly and semi-annual servicing requirements.

• • •

The importance of overtime operation of only a few machines is generally overemphasized. By dividing the machines in small groups this objection becomes of minor importance.

• • •

Without some check on maintenance supplies and materials, much may be wasted. Too much red tape, however, may delay urgent servicing requirements.

Portable Storage and Special Hooks Simplify Pipe and Tube Handling

PIPE and tubes, and other products with similar dimensional characteristics, have for many years been difficult items to handle, and throughout the United States today it is still a familiar sight to witness costly manual lifting piece by piece, of lengths of pipe into and out of storage departments, and on and off delivery trucks. In mills and in larger jobber warehouses, great progress has been made in recent years in utilization of cranes, monorails, hoists, magnets, special slings and cradles to permit larger lot handling with consequent reduction in costs.

The most recent adoption of modern methods to solve such a problem has been in the plant of Steel & Tubes Inc., Cleveland, where a complete system of portable pipe storage racks has been coupled with a special attachment on the overhead electric traveling crane to produce a storage department that is believed to be the last word for handling long length commodities.

Pipe Laid in Cradles

The basis upon which this handling system is built consists of a number of welded cradles constructed in such manner that they fit into one another, permitting stacking to the maximum height of the warehouse, with due allowance for crane hook clearance. A view of these new portable storage racks is shown in an accompanying illustration. The crane is equipped with a special tandem hook and cross arms for grabbing the cradle posts at the four corners.

In addition to economy of handling, this system has resulted in greater speed of the operation, neater arrangement in the warehouse, better utilization of storage space, simplification of inventory and greater safety to operators and workmen.

Essentially, the system is similar to one which was first introduced and placed in operation several years ago at the plant of the A. O. Smith Corp., Milwaukee, for handling heavy pipe in an outdoor storage yard.

This greater utilization of cubic contents of a warehouse or storage department is one of the goals toward which materials handling equipment has been moving. The reduction of waste in movement of both raw materials and finished products by the use of equipment permitting heavier unit loads has been achieved in many directions. The lack of suitable equipment in customers' plants prevents, in many instances, the attainment of the ultimate in benefits from such efficient methods.

The warehouse in which this pipe storage system is utilized is 462 feet long and 83 feet wide. Capacity of an individual cradle is 126 tubes per rack of 3-inch tubes 12-gage, and 70 tubes per rack of the 4-inch, 10-gage. Total capacity of the warehouse is approximately 2000 tons, and the capacity of the overhead crane is 10 tons.

Up to the present time, 2400 sections, or 1200 racks, have been installed in this warehouse. While it is difficult to estimate all the advantages of this portable system over the older methods of transporting and stocking boiler tubes and similar stock, its efficiency is in-

VIEW of new portable pipe storage racks at plant of Steel & Tubes Inc., Cleveland, showing cradle of tubing held by the crane and being lowered on top of another cradle. Cradles are stacked four high. Note the special tandem hook and cross arms which engage eyes at top of cradle posts, assuring ease of handling as well as stability of the load

dicated by the fact that it is now possible for a man to move as many as 126 tubes in one operation.

To further prove the mobility of the system, consider the fact that it is possible to move the entire stock of the warehouse within the period of 8 hours.

Another interesting materials handling feature of the warehouse is the transportation feature in packing and shipping the tubes. Allowance has been made in the construction of the building to permit freight cars to enter so that they can be loaded by the same crane which removes the tubes from stock. Consideration has been given also to truck transportation requirements and a special truck loading platform has been built which also is accessible by crane.

• • •

Structural Steel Handling

HARRIS STRUCTURAL STEEL CO., New York, has been using a crawler-type locomotive crane with a 50-foot boom for placing steel girders on the elevated highway being constructed along the Hudson river. Some of the girders weigh 60 tons. The crane is equipped with special manually set clutches with vacuum assistors. Hoist brakes also have similar assistors.

Another feature is a third drum with crowd and propel clutches, which operates independently and can be used for lifting lighter loads, or for "snaking" material to the crane. A special backhitch gantry is designed to provide a low gantry with high gantry effect. For long range work, boom hoist lines are supported by a folding gantry, which also has the effect of a high gantry, and which can be folded out of the way when the crane is being moved from one job to another.

An equalizing counterweight is another feature. This is provided by an auxiliary boom attached to the counterweight, which in turn supports an extra counterweight, control being through an auxiliary boom hoist unit. The auxiliary boom hoist shaft is equipped with two drums, one controlling the extra counterweight and the other controlling the raising and lowering of the auxiliary boom. Either boom can be raised or lowered independently of the other. The crane is equipped with roller bearings at every vital bearing point, helical cut gears throughout, square lever shafts, interchangeable and reversible brake and clutch band linings, and independent clutches.

• • •

Ram and Fork Trucks

PROBABLY no branch of the materials handling industry has made more rapid progress in development of new equipment for meeting the needs of the steel industry than has the industrial truck manufacturing group. As a consequence, a visit to leading mills where continuous production methods are utilized leaves the impression that fork and ram trucks are rapidly becoming standard units for the solution of many difficult steel mill problems.

Indicative of the rapid expansion in the use of this class of machines is a recent instance in which a single order was placed with one of the manufacturers calling for delivery of 11 units, six of them fork trucks and the other five rams.

The capacity of the trucks has increased with almost unbelievable rapidity and one manufacturer recently commenced production of a 30-ton unit. Several different types and many models are now on the market for handling loads up to 20,000 pounds. In addition, one manufacturer has developed a special truck equipped with motor-driven roller platform with capacity up to 40,000 pounds, and another has announced within the past few weeks a gas-electric model for this same 40,000-pound load but with power chain conveyor instead of the rollers as a platform.

Coil handling trucks are being utilized in many operations, the main ones being in transporting coils to and from storage to conveyors, from the end of the picklers to the cold rolls, and to rotary shears. The fork trucks are particularly adaptable for transportation of sheet packs from conveyors to storage, stacking packs in storage areas and handling out of storage to shipping departments or into freight cars.

The necessity of resisting enormous strains and stresses developed through handling unusually heavy loads and through encountering sudden impacts has brought about free use of special heat-treated alloy steels in the major operating parts of the trucks.

There is a wide variation in drives of the different models. One recently announced line of fork trucks has front wheel drive and rear wheel steer while another manufacturer in his ram trucks features four-wheel drive and eight-wheel steer. There is center control and rear seat control available, and the same model truck in some instances may be secured with either forks or rams.

• • •

Tin Plate Handling Device

ONE method of handling tin plate makes use of a special portable cantilever jack which lifts packages of plate weighing from 200 to 3500 pounds to a height that permits an ordinary lift truck to get under the load and transport it. This jack is furnished with a lowered height of 2 inches which permits handling tin plate on 2¼-inch runners.

EASY handling of 60-ton steel girders for New York elevated highway. Crawler-type crane with 50-foot boom is used. Photo courtesy Lima Locomotive Works

Manual Operations Still Predominate in Surface Finishing of Bicycles

FINISHING treatments always have played an important part in the bicycle manufacturing business but the style of finish, of course, has varied with the times. During the bicycle "craze" of the Nineties the design of the machines was simple and the majority were finished in several coats of black enamel baked in place, with the bright work nickel plated. This was an expensive finish for that day because each coat of enamel was rubbed down with pumice and water and the polishing methods followed to prepare the bright work for nickel plating were far from being as efficient as they are today.

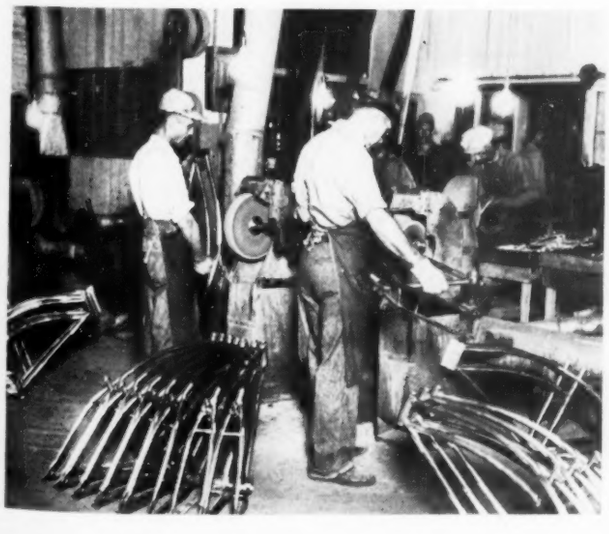
Since the first bicycles were made, the manufacturer has been confronted with three problems—design, quality and finish. The design must meet public approval while the quality of the product must be high in every respect because bicycles meet with severe usage. A high finish is necessary since finish has much to do in marketing a product in a competitive field. Modern machines are highly finished in black or colored synthetic enamel, a combination of colors often being used while the accessories comprise numerous bright parts. Frames, tanks, chain guards, mud guards and rims are usually finished in two colors, while the cranks, pedals, handle bars, lights, speedometer and many other parts are nickel plated and highly polished. The parking stand, spokes, fender braces and chain guard clips are cadmium plated, the spokes being highly buffed to bring out a satisfactory luster. The average machine weighs 40 pounds and is truly a beautiful example of the modern bicycle builder's art with respect to both design and finish.

Finishing Raises Costs

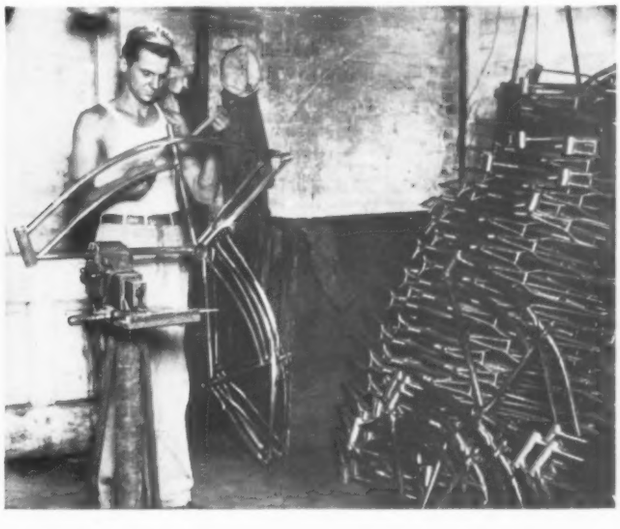
Finishing of bicycles calls for a large amount of manual labor which appears to be unavoidable. Finishing processes as far as frames and forks are concerned have been simplified through the use of modern products, but bright parts must be polished manually before plating just as they were many years ago since no automatic polishing and buffing machines have yet been devised which can handle this type of work. Also, there always will be a large amount of hand work in preparing frames and forks for the final surface finish. Bicycle manufacturers show that it costs as much, and in some cases more, to finish a bicycle than it does to build it. This is readily apparent from the following description of some of the processes followed at the plant of the Shelby Cycle Co., Shelby, O., one of the large manufacturers of high grade bicycles in the United States.

Operations preliminary to finishing consist of assembling the frame which is composed of steel tubing

Portions of frames can be polished on formed face canvas wheels. Experienced operators can polish at least half the tubing in this manner



Filing and smoothing with abrasive cloth is necessary to polish the frames completely. Much care is necessary if surface defects are to be avoided



This advertisement, which directs the public's attention to the important services of dealers in steel products, appeared in The Saturday Evening Post, Sept. 26 . . . Collier's, Sept. 26 . . . Business Week, Sept. 26 . . . Nation's Business, October.

an' a load of pipe–

and make it snappy!"

REAL telephones are ringing, placing real orders like this—thousands of times every day, all over the country. At the other end of the wire is a local merchant who sells steel and steel products—there is at least one in every community. He is the dealer, the jobber or the distributor selling by the pound, foot or ton.

In this intricate age of ours, living would come to a standstill without steel distributors. For example: An explosion wrecks a small factory building. Men are out of work; the plant can't operate. The contractors rebuild the structure over a week-end because they can get the many necessary kinds of steel—tons and tons of it, at once—from a nearby steel warehouse. Or a homeowner, doing a few odd jobs around the house, needs a pound or two of assorted nails. He gets them, right away, from a local dealer, who has all sizes in stock because he is able to replenish his supply overnight from a nearby jobber.

Other steel jobbers and distributors supply the pipe that plumbers use, or the steel girders to be placed in the basement of a home, or a small piece of alloy steel needed by a machine shop, or the electrical cable required by an electrician—even a few pieces of stainless steel for a store window. Farm and lawn fences, poultry netting, wire rope, galvanized sheets for barn and house roofs—practically any kind of steel that anybody uses—are carried in stock by these distributors, ready for delivery at a moment's notice.

United States Steel is proud to be a part of the service made available by these distributors. Bridges, ships, buildings, railroads—these require huge tonnages of steel. But the biggest purchasers of all are the distributors—selling to thousands of individuals and businesses. Their success is vital to the success of United States Steel.

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CARNEGIE-ILLINOIS STEEL CORPORATION • COLUMBIA STEEL COMPANY • CYCLONE FENCE COMPANY
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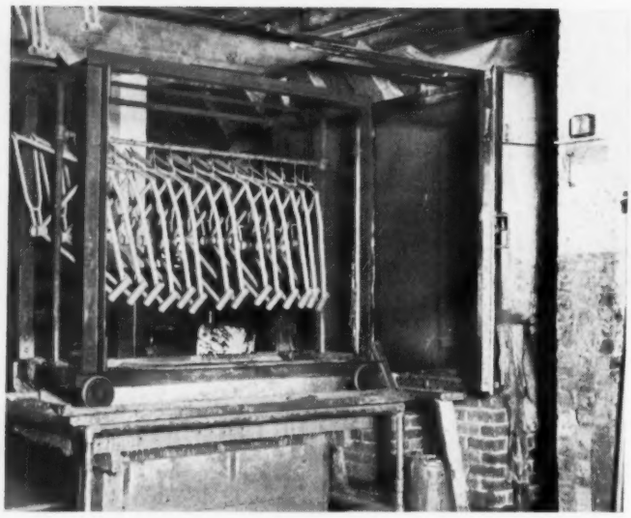
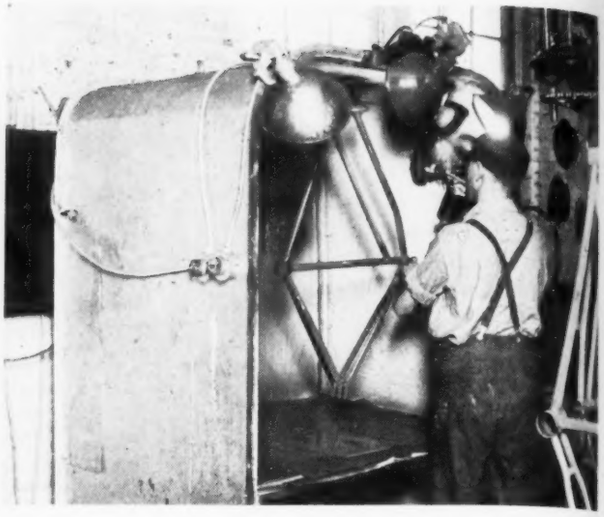
UNITED STATES STEEL



Priming coat is applied to frames and forks by dipping. This is followed by a baking operation in ovens of special design



Finish coats of synthetic enamel are applied by spraying. Note adequate lighting facilities with which this spray booth is furnished

and steel stampings. The frame is first spot welded to hold the connections in place and then permanently fastened by means of dip brazing. In this operation the joint and the surrounding tubing is dipped in molten spelter which runs through the joints making a permanent connection.

Frames Require Hand Polishing

After brazing, the frames are pickled in a hot sulphuric acid solution to remove scale. Then they are ready for polishing. Due to its shape, a bicycle frame cannot be polished wholly on wheels. However, wheels with formed faces can be utilized to some extent as shown in the accompanying illustrations. The machine used is a belt driven polishing lathe fitted with wheels built up from canvas sections glued together. These wheels are 16 inches in diameter with a 2-inch face and operate at a surface speed of approximately 7500 feet per minute. The polishing medium is No. 60 manufactured alumina. By using care in manipulating his work an experienced man can polish at least half of the tubing section in this manner. While the frames are comparatively light, about 7 pounds, they are somewhat awkward to handle until a polisher develops the necessary skill through practice.

A large amount of hand work follows polishing on wheels. Referring to the accompanying illustrations, it is shown that the frame polisher grips the work in a vise fitted with special jaws. First the superfluous spelter is filed down smooth with 10-inch files of a special cut something between a bastard and a mill file. Then hand polishing with strips of manufactured alumina cloth follows. Through practice these finishers become proficient and turn out work with remarkable speed. Care must be exercised in this work inasmuch as every slight surface defect will be magnified when the lacquer is applied later.

Hand Work on Forks

On first thought it would appear that a bicycle fork should present no difficult polishing problems. This member is composed of two side pieces brazed to a drop forged crown. While it is true that some of the outside can be polished on wheels and that some of the inner portions can be finished on polishing belts, much hand work is necessary as shown in the illustrations. Spelter must be filed away and the surfaces leveled as previously described in connection with the frames.

After the frames are finished they are ready for the priming coat

Prominent parts such as cranks must be highly polished by hand before plating. Bright work is also color buffed to obtain the desired high finish

Forks also must be polished and filed by hand. Special jigs are provided to hold work at a convenient angle in the vise

of enamel. This is a dipping process as illustrated. Several frames are arranged on a rack and dipped in a tank. They are then run into a gas fired oven where they are baked for 30 minutes at a temperature of approximately 250 degrees Fahr. The enamel thus applied coats both the inner and outer surfaces of the frame, affording it complete protection.

The finishing coats of synthetic enamel are applied by spray in booths which are provided with an exhaust system for carrying away all fumes so that no cause for injury to the painter's health is present. The booths are also provided with adequate lighting facilities which are indispensable in carrying out a good finishing job of this kind. In the bicycle manufacturing industry the spray method is considered far superior to hand coating or dipping for finishing coats.

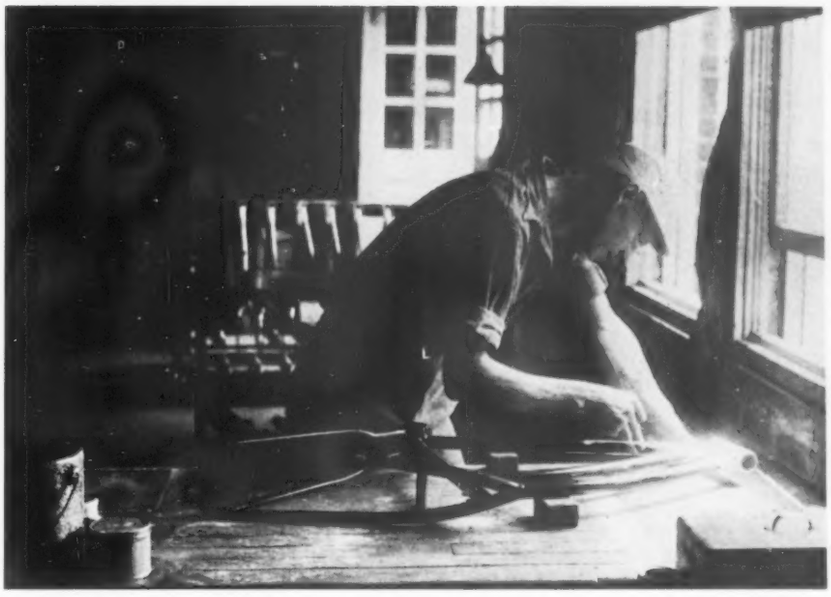
Most bicycle frames are two-color jobs, such as maroon and blue, white and blue, and many other combinations. A comparatively new straw color finish also is popular. On a two-color job the connections generally are a different color which is run onto the frames in vees. To do this job rapidly the painter uses "frisket" material such as employed by automobile painters. It is cut to form a mask to protect the parts beyond the edges of the color pattern.

The finishing coats are baked in a continuous type gas-fired oven of the company's own design. Baked at a temperature of approximately 200 degrees Fahr., the finishing coats are quite durable.

Artistry Needed in Striping

A certain amount of striping is necessary on bicycle frames. This is a manual operation which cannot be replaced by machinery although fenders can be striped semiautomatically by mechanical devices. The striper uses camel hair pencils and lays the color on by hand. This operation requires a high degree of skill for nothing detracts more from an otherwise good paint job than poor striping.

Careful polishing is required in preparing such parts as cranks, sprockets, handlebars and the like for plating. In the accompanying illustrations is shown the method of polishing cranks and the sequence of operation is practically the same on other parts. Preparatory to polishing, the flash marks must be ground away as these parts are drop forgings. For this work a solid 14 x 2-inch manufactured alumina wheel is used, 36 grit medium grade. The next operation consists of polishing on canvas wheels 14 x 2 inches. These wheels are made of several sections glued together. The grits successively used are 60, 80 and 120, manufactured alumina. Then comes an operation with No. 150 grit done on compress wheels. This is a grease operation.



Striping of bicycle frames can only be done by hand. A high degree of skill is required for this operation as nothing will detract more from an otherwise excellent finish than poor striping

After cleaning to remove all grease, the parts are given a cyanide copper strike, followed by nickel plating, an acid copper plate, and finally another nickel plate, a finish known to platers as "nickel-copper-nickel." This constitutes step plating and results in a durable job wherein no imperfections show. Copper and nickel plating are color buffed on loose muslin wheels using rouge as the buffing agent. This is a lengthy plating process but the quality of finish demanded on modern bicycles makes it necessary. Polishing is hand work except in the case of sprocket wheels which are mounted on a magnetic chuck and finished in an automatic machine adapted from a rotary table surface grinder.

From the foregoing it is apparent that manual labor predominates in finishing bicycles, but in spite of the fact that a high grade bicycle sells for less than half its price during the early days of the industry, the modern mount is better finished in every way than its predecessor and presents a much more attractive appearance.

Molybdenum Used in New Bright Zinc Plating Process

New and radically different type of zinc deposit, known as Grasselli bright zinc, is announced by Grasselli Chemical Co., Wilmington, Del. In contrast to former electrogalvanizing, which in most cases gave dull, gray and porous zinc deposits this new process is said to deposit zinc in a brilliant, dense and ductile form.

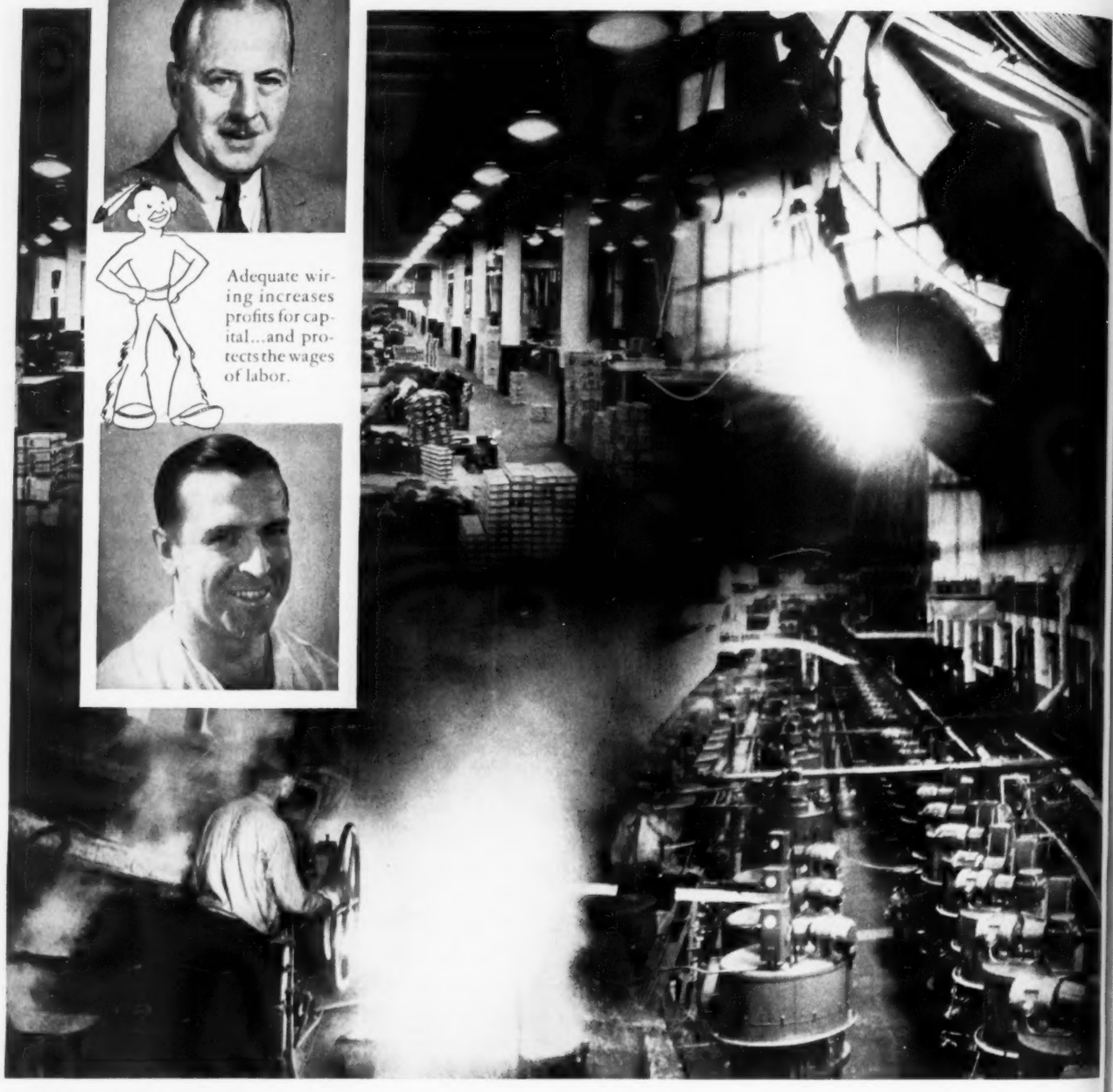
Primary function of zinc deposits is to protect the underlying steel or iron from rust and corrosion. A rough, porous coating which will hold moisture and easily collect dirt and foreign materials, especially microscopically small metallic particles, will discolor and deteriorate more rapidly than a dense, smooth plate, and, consequently, afford less protection against rusting and corrosion of the base metal than an impervious smooth deposit offers.

While appearance is often of secondary consideration, it is becoming more and more necessary to provide products with eye appeal. Bright zinc produces an ornamental finish. Thus, one objection to zinc plating that has in the past ranked it inferior in the class of electrodeposited finishes has been overcome, and, at the same time, its value from a standpoint of rust prevention has been increased appreciably.

These improvements in the electro-deposition of zinc are largely the result of the use of molybdenum. Use of molybdenum in the electro-deposition of zinc may parallel its use in stainless and alloy steels. In contrast to former methods of electrogalvanizing, this new process operates at normal room temperatures, higher current efficiencies, high or low current densities, with a bright plating range from 15-100 amperes per square foot.

...Make Full Use of the

Adequate wiring increases profits for capital...and protects the wages of labor.



Shop Talk. Satisfactory solution to the multiplicity of cable problems can best be assured by careful selection of the proper combination of conductor sizes, insulation, protective covering and finish.

Anaconda manufactures a complete line of wires and cables for all uses. A few examples follow: transmission and distribution...industrial, mining, transportation...commercial and residential construction...wires and cables for use in manufacture of electrical apparatus and appliances.

"DURACODE," one of the large family of Anaconda products, is designed to serve industry economically where conditions are unusually severe. Is highly resistant to moisture, acids and alkalies; offers low susceptibility to combustion and explosion.

Anaconda Wire &

Electric Power You Buy

In 9 out of 10 factories, losses are incurred daily by inefficient use of Electric Power. And most of this loss is needless. Let us show you how to stop wasting power!

Every industrial executive recognizes the value of electric power. But every executive is not getting full value from the electric power he pays for. There is one big reason . . . INADEQUATE WIRING.

Losses the books never record

Losses due to poor wiring do not always show up on the books. They are caused by interrupted production which often results in loss of materials in process. By unsatisfactory performance of equipment due to voltage drops from "overloaded" wiring. By excessive maintenance costs, high insurance rates, preventable accidents. By wages paid during outages. And by the dissipation of current as heat rather than useful power.

Consider your own plant! The odds are 9-to-1 that you are suffering losses through inadequate wiring. And it costs you nothing to have your wiring system inspected . . . to make sure that improper wiring is not holding your profits down.

Anaconda can help you make full use of the electric power you buy. Our engineers have had a wide experience with industrial wiring problems. Write us, at 25 Broadway, New York. When your specific problem requires engineering attention, we will cooperate with your own plant engineer without obligation to you. 36445-A

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from mine to consumer
REG. U.S. PAT. OFF.

What adequate electrical wiring does for you

1 Assures uninterrupted service
2 Prevents voltage drops from "overloading"
3 Permits more convenient location of equipment
4 Reduces maintenance and repair costs
5 Prevents loss of power in form of heat
6 Increases the safety factor, lowers insurance rates

Cable Company

General Offices: 25 Broadway, N. Y.
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WELDING, etc.—by Robert E. Kinkead

Where Is Equipment for Welding Small Buildings?

IN ALL the important cities of the country, welded houses, gasoline service stations and other small buildings may be seen in the course of erection. The public that pays for this type of construction has an opportunity to observe at close hand what is being purchased. It appears that the time is opportune for some plain, blunt words to be said to the welding industry.

In practically every case, experienced welding men will agree that more welding is used than is necessary for the strength of the structure. But the appearance of the welds is terrible. The purchaser who is unfamiliar with welding takes a look at the much touted

IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of STEEL.

welding on his job and often says, "If that is what you call welding, you have a long way to go before you have a commercial process." He can, of course, be shouted down if enough salesmen and welders work on him, but he is not convinced. The only way he can be convinced is to make the welding look like a workmanlike job, in addition to being one.

Much of the difficulty in appearance of the weld is due to the fact that equipment which was designed for other uses is being applied to the job of field erection of this type of building. Very little new equipment particularly adapted to this use has been put on the market, although the merits of welded buildings have been extolled widely. The welding industry now finds itself in an embarrassing position because the public has said, "Well, go ahead," and the industry is unprepared to furnish equipment with which the welding operators can turn out jobs of creditable appearance within the permissible cost limits.

The welding industry does not overlook many opportunities to increase the sale of equipment in the building field the time is ripe for intensive cultivation.

• • •

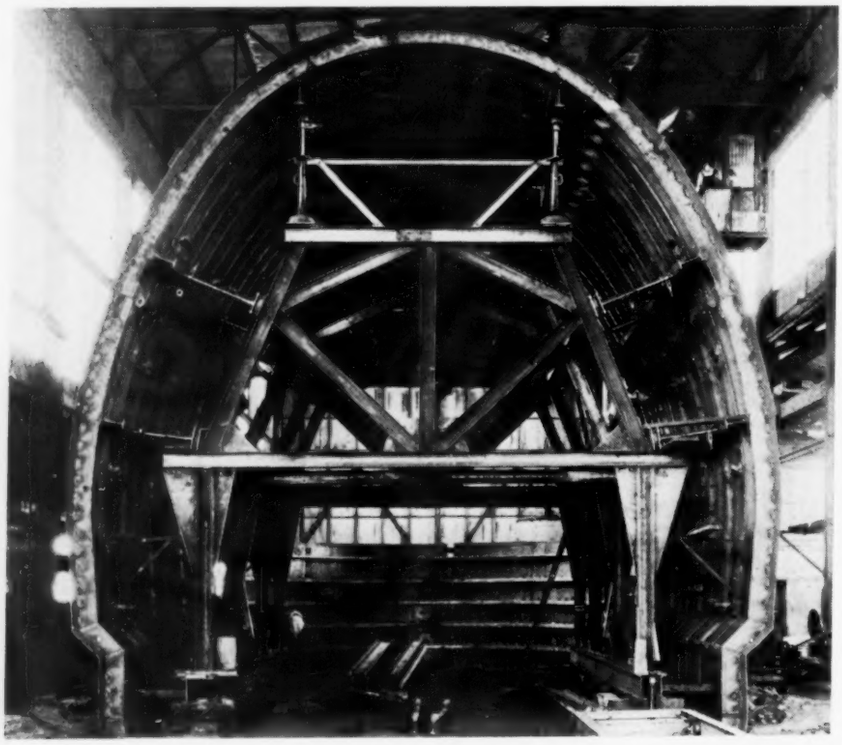
"Enemies" of Welding

ACROSS the country from New York to Chicago, the welding fraternity has located and identified about a dozen men whom they label "enemies of welding." There used to be more; their number is dwindling. We know some of them personally and regret the breed is dying out. Public acceptance of welding has been so phenomenal that engineers who have been reluctant to be "sold" on it have been shouted down. Yet sober consideration of the facts should result in recognition of the service these "enemies" have given to the welding industry.

There have been no disastrous bridge, building, ship, or boiler drum failures in which weld failure was the prime cause, yet vast amounts of welding have been done in these fields. Credit the "enemies" of welding with that. No small part of the present perfection of welding is due to stout hearted opposition of engineers in days gone by to welding practices which were not perfected to the point at which they could be safely applied. Twenty years ago any welding salesman would guarantee unhesitatingly to weld a brick to a concrete wall.

When the "enemy" of welding has been right, the industry has corrected itself. Where he has been just bullheaded, he has usually talked himself out of a job. But any rapidly moving technical industry is on the merry road to ruin without tough minded "enemies" or critics.

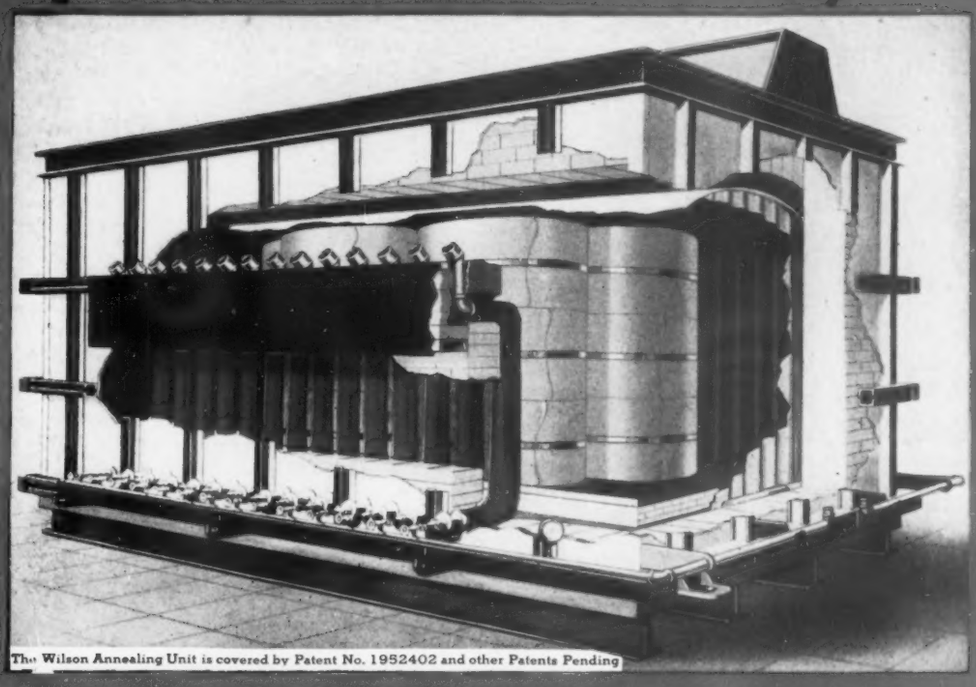
Traveling Jumbo for West Coast Tunnel



COLLAPSIBLE, all-steel, electrically welded, this concrete form is supported by a traveling jumbo and is said to be one of the largest ever constructed. It was built by the Berkeley Steel Construction Co., Berkeley, Calif., for use in the Broadway tunnel now under construction there. Outer sheathing is of steel plate, and the entire structure involved 65 tons of steel. The forms, 30 feet long, 43 feet high, 30 feet wide and mounted on rails, are moved into place and a 60-foot section of concrete is poured. When the concrete has set, the forms are collapsed and moved ahead to the next section where the process is repeated

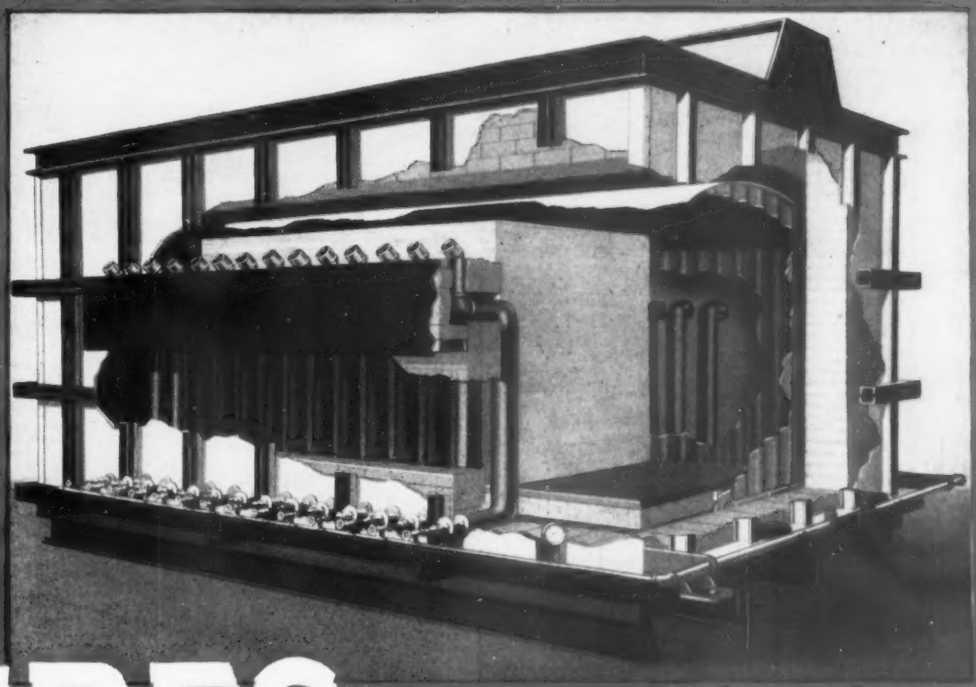
VERTICAL TUBES

for better Annealing



The Wilson Annealing Unit is covered by Patent No. 1952402 and other Patents Pending

Sheet and strip mills using Wilson annealers are saving from 10% to 15% in fuel consumption.



are superior for COILS OR SHEETS

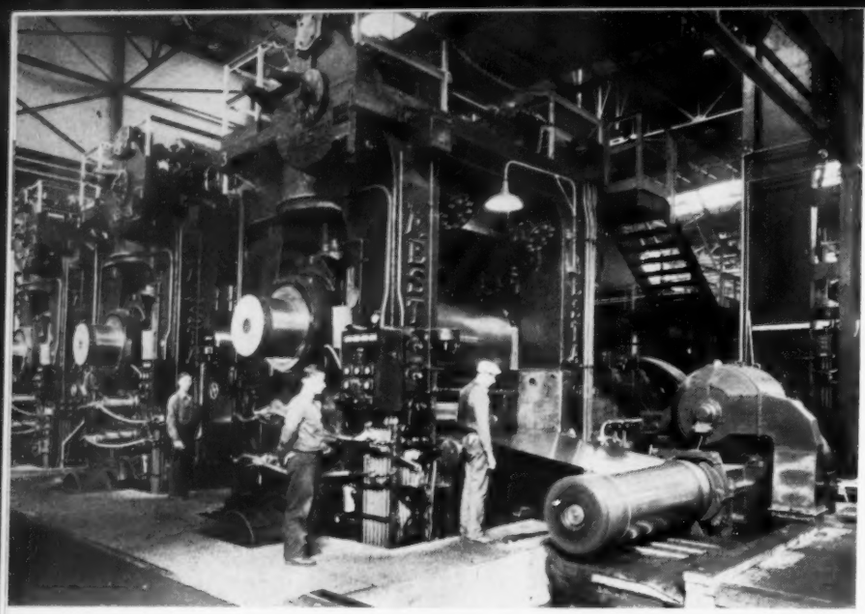
The largest sized sheets used by the automotive industry are easily annealed in the Wilson Vertical Tube Type Furnace.

The WEAN ENGINEERING Company, Inc.

Warren, Ohio

ASSOCIATE COMPANIES

The FLINN & DREFFEIN CO. The McKAY MACHINE CO. LEE WILSON ENGINEERING CO.

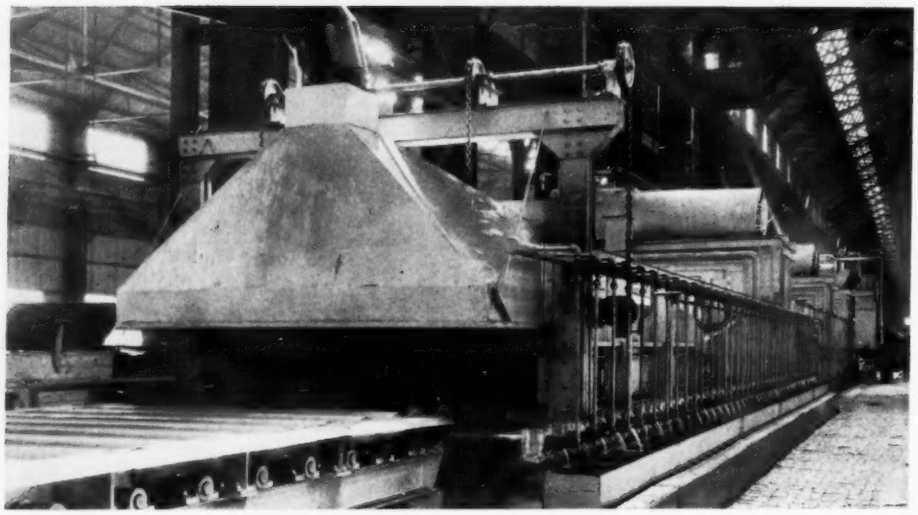


Industry's Largest Cold Strip Mills Now Scheduled

Views at Great Lakes Steel Corp., Ecorse, Mich

Left: Delivery side of 96-inch 3-stand tandem cold mill with tension reel

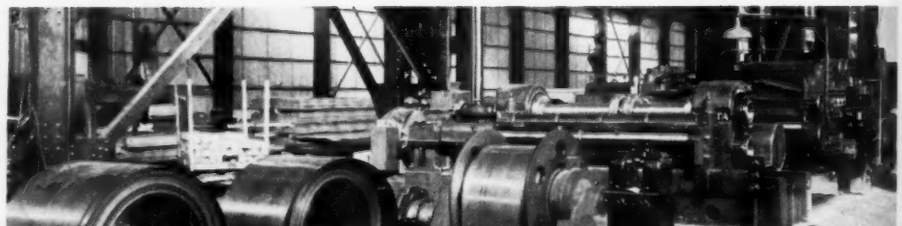
Below: Delivery end of oil-gasification disk-type sheet normalizing furnace

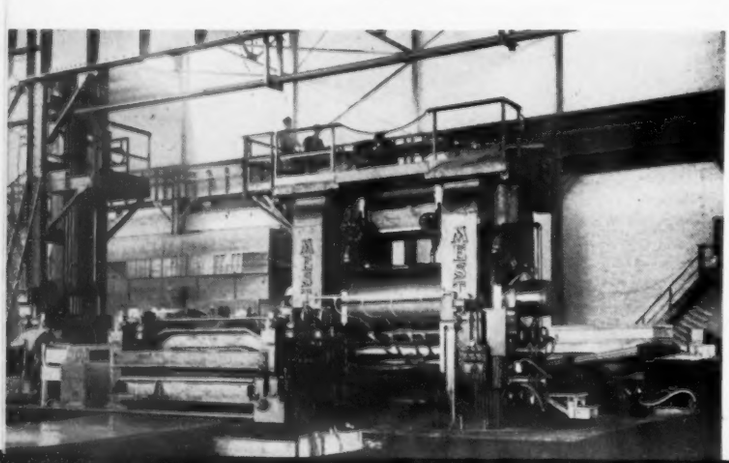


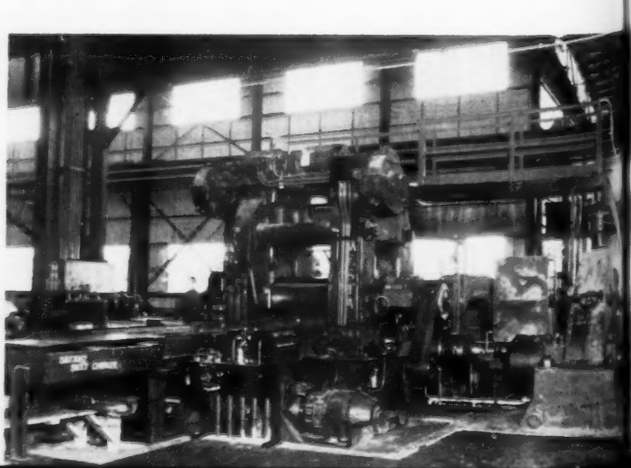
Right: Entering side of one of the three shearing and cutting units

Below: Delivery side of 96-inch skin pass mill equipped with roller leveler and sheet piler

Lower right: Entering side of 54-inch skin pass mill showing sheet charger in foreground







PROGRESS IN STEELMAKING

New Continuous Mill in Detroit Makes Hot Strip Steel 90 Inches Wide

STEEL in 20 gage and heavier and in widths up to and including 90 inches is being produced faster than ever before possible at the recently completed 96-inch broad stripsheet mill of the Great Lakes Steel Corp., Detroit. The steel passing down the 1900-foot hot mill building attains a maximum speed of 25 miles an hour by the time it arrives at the rotary flying shear near the last finishing stand of the hot mill train.

Each large backup roll in the 4-high stands of the hot mill train weighs 65 tons. Some of the motors driving the mills are rated at 4500 horsepower each and the complement delivers more than 95,000 horsepower. Electric power consumed by these electric drives would supply 200,000 homes.

When specifications call for coiled material, the strip leaving the hot mill is conveyed 385 feet from the last finishing stand to one of two coilers. Here it is converted into a coil having an inside diameter of 24 inches and an outside diameter of 44 inches.

Employs Zone System

On the opposite page is shown some of the equipment which handles the strip coming from the hot mill. The normalizing and blue annealing furnace is 108 inches wide and 140 feet long. It is built with an 80-foot heating zone and a 60-foot cooling zone both of which are equipped with oil-fired combustion ducts wherein the fuel is converted into a gaseous mixture. The conveyor, which operates in the heating zone, is composed of alloy disks and shafts, the latter being supported on alloy roller bearings within the furnace. The shafts and disks in the cooling zone are water cooled.

Conveyor shafts extending through the sidewall of the furnace are direct connected through bevel gears to a line shaft extending the entire length of the furnace. This shaft is composed of three sections, each provided with a driving unit which permits the steel to pass through the furnace at a speed ranging from 10½ to 42 feet a minute. The charging end of the normalizer is equipped with a set of pinch rolls and a feed table; runout table, roller leveler and piler serves the discharge end.

Strip for cold reduction first passes through the pickling line which consists of a loading conveyor, coil upender, feed reel, combination processor and straightener, upcut shear, stitcher and pinch rolls at the charging end. Then follows four acid tanks each 96 inches wide and 60 feet long and two cold and hot water rinsing tanks 96 inches wide and 26 feet long. Strip leaving the picklers passes through a hot air drier, pinch rolls, upcut shear, oiling rolls and coiler.

Speed Through Tanks Varies

The strip in transit through the pickler travels at a speed ranging from 55 to 165 feet a minute. After being coiled it is discharged onto a conveyor which transfers it to the cold rolling department. Here is located a 54-inch and a 93-inch 3-stand 4-high tandem cold mill, two 93-inch 4-high single stand skin pass mills and one 54-inch 2-high single stand skin pass mill.

One of the 93-inch single stand mills is equipped with a back tension feed reel and a tension reel for coiled material as well as a sheet charger, conveyor, leveler and piler for handling sheets when scheduled. The other 93-inch single stand mill is designed for skin pass rolling only.

Both sheets and coiled stock are skin pass rolled on the 54-inch 2-high cold mill. Three automatic shearing and trimming units are provided for cutting the cold rolled stock to sheet lengths.

• • •

Cement Is Acid Resisting

Deleterious influences of oil, grease, water and acids are resisted by a new floor patching cement which is marketed in two forms, one ready to use with the exception of the addition of water, and the other to be mixed with portland cement and water before it can be applied. The material is composed of hard minerals, that when set become harder than corundum. The cement develops a compressive strength in 24 hours exceeding 6000 pounds per square inch and in 28 days a strength in excess of 15,000 pounds per square inch and a tensile strength of 1000 pounds. It is acid resistant and waterproof and is highly suitable for floors in pickling departments. Repairs can be subjected the following day to loads of over 1 ton. The material bonds tenaciously to the old slab and is trowe'ed in place easily by unskilled mechanics.

• • •

Employs Roller Bearings

Among improvements now under way in the Chicago district are two high speed wire rod mills. These will be the first rod mills in this country to be equipped throughout with roller bearings on all rolls and drives. The new mills, which will start initial production in December, will have a total capacity of 220,000 gross tons, based on a 6000-hour campaign.

• • •

Oilproof Hose Is Marketed

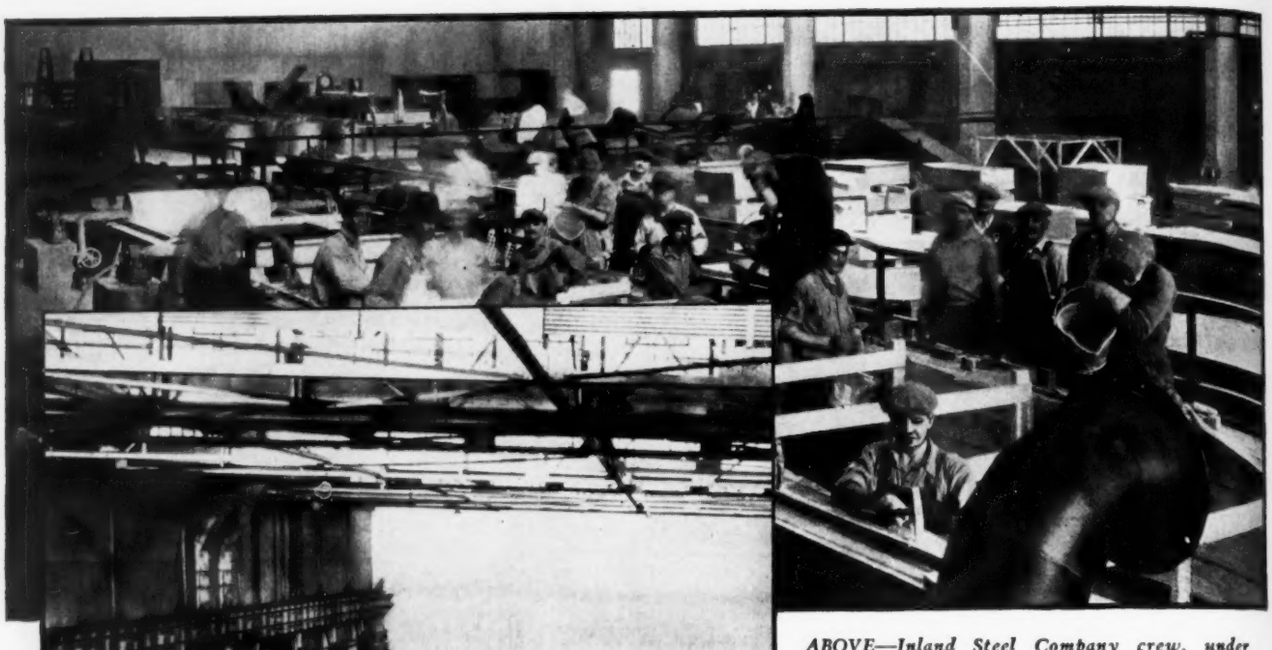
New air hose designed especially to overcome the deteriorating effects of hot oil from compressors has been developed. It can be saturated with oil for long periods without affecting the hose serviceability. Other features are high resistance to heat, high pressures, abrasion cutting action and exposure to the sun and weather.

• • •

Prevents Air Infiltration

Infiltration of air at open-hearth buckstays where it is difficult to apply insulation can be avoided by installing pieces of steel sheets between the buckstays and the brickwork. The edges of the sheets are allowed to project in order that they may become imbedded in the insulating concrete when poured. At an open-hearth plant where this practice was followed the insulation stayed in service about four years before serious cracking or deteriora tion occurred.

Again Inland Steel



ABOVE—Inland Steel Company crew, under supervision of Goodrich engineers, installing brick sheathing over the Triflex lining, in Inland's new wide strip pickling line.

Rubber-lined sewer (Triflex) for disposal of waste acid. Developed by Inland and Goodrich engineers working together, it has eliminated wet and dangerous floors.

General view of Inland Steel pickling department—twelve 60-foot tanks, all lined with Goodrich Triflex.

Goodrich

Chooses GOODRICH-LINED TANKS

Third continuous strip pickling line in two years now operating. Inland Steel tank equipment now all Goodrich-lined.

Two years ago Inland Steel Company installed its first line of four Goodrich Triflex tanks at the Indiana Harbor plant. Down went pickling costs. Acid leakage and tank repairs stopped. Shut-downs for tank repairs were a thing of the past.

On the basis of definite records for these first Goodrich tanks, another line was installed, and now a third line—twelve 60-foot tanks in all. Today at Inland all acid tanks, sewers, scrubbers, fans and exhausters in the strip-pickling department are Goodrich-lined.

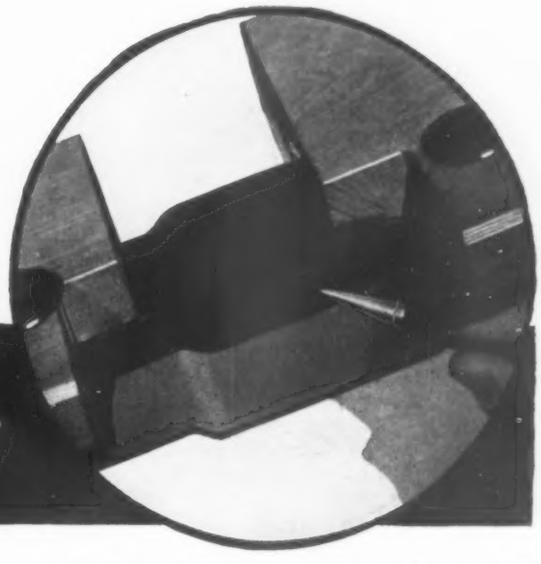
Here's what Inland found out and what you, too, will experience with these tanks. Goodrich Triflex lining (a layer of hard rubber vulcanized between two layers of soft rubber) absolutely stops acid leakage . . . not for weeks but for years. We have made Triflex for five years and have yet to hear of a leak unless caused by some severe accident.

With leakage stopped, acid does not attack the tank itself, and therefore tank repairs are a thing of the past.

With tank damage ended, you have no shut-downs for repairs —pickling is continuous—production is high—costs are low.

Only Goodrich can give you a tank lining that is positive protection against leakage, because only Goodrich can give you Triflex rubber lining applied by the Vulcalock bond. If you want to eliminate, once and for all, shut-downs, acid waste, tank repairs, write for a sample of Triflex and complete engineering data to The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio (In Canada: Canadian Goodrich Co., Ltd., Kitchener, Ont.)

Inland's first Goodrich tank and Goodrich-lined exhausters. It was on the proved savings made by this installation that Inland added other Goodrich tanks and is now practically 100% Goodrich equipped.



Patented Goodrich expansion joint, made part of all Goodrich Triflex tank linings. Prevents cracking or buckling due to expansion and contraction.

Rubber Lining

ALL *products problems* IN RUBBER

Engineers Report Advances In Steelmaking Technique

STEEL melting shops not equipped previously with open-hearth control should install a most complete system rather than to attempt to control one function or another individually. Only by making a laboratory of one of the furnaces in a given shop can the operator determine the particular requirements of his individual problem. A complete control enables operation under a variety of test conditions and determination of the best mode of operation as a guide for the general routine of the shop.

The foregoing were the recommendations of A. F. Spitzglass, vice president, Republic Flow Meters Co., Chicago, in speaking before the combustion engineering division of the Association of Iron and Steel Engineers in Detroit, Sept. 24. A resume of papers presented at the earlier sessions of the thirty-second annual convention of the association appeared in last week's issue of STEEL.

In discussing the operation of open-hearth furnaces, Mr. Spitzglass emphasized that the operator must be in a position to adjust the fuel rate in control volumes. There is a tendency to set liquid fuels by hand. He pointed out that while the gas-fired fuel rate can be set by hand, yet accurate metering is more profitable.

IN DESCRIBING the Amco soaking pit, P. M. Offill, vice president, Amsler Morton Co., Pittsburgh, pointed out that this type pit affords a labor saving of 60 hours a week in making bottom. This, he stated, is effected by the absence of washing and reduction of scale thickness. Approximately 180 pounds of iron and cinder is removed per week compared with 2700 pounds in the case of regenerator pits. Iron content of the slag averages 22 per cent as compared with 60 per cent for average practice. This light slag, the speaker contended, makes mechanical removal certain.

The fuel consumption averages about 200,000 B.t.u. per gross ton of bessemer steel ingots. The heating time compared to the reversing-type pit averages from 2 to 2¼ hours at a plant in the Pittsburgh district. The temperature of the air entering the pit is 1300 degrees Fahr.

Proper application of insulation is most important as is the operation of the furnace after insulation is applied. Care must be taken to see that the hot face temperature of brick does not exceed that temperature before being insulated. This was brought out by A. V. Leun, refractory engineer, Bethlehem Steel Co., Bethlehem, Pa.

Manufacture of basic refractories, chrome and magnesite brick, has been greatly improved, the speaker stated, by means of heat and chemical treatment. The load carrying capacity and spalling resistance of chrome brick have been increased to such an extent as to make its application greater and more diversified. Application of lightweight fireclay brick will effect higher fuel savings especially in those furnaces where operation is intermittent, he contended.

Brick Withstands More Heat

Because of the demand for greater production, the application of external insulation, the use of higher working temperatures and the continued drive for cleaner steels, brick manufacturers have been obliged to produce a fireclay brick possessing greater refractoriness than first quality brick. These brick, the speaker stated, are capable of standing temperatures up to 200 degrees Fahr. higher than first quality clay brick. They have applications in such places as forge furnaces, kilns, blast furnace stoves, boilers, open-hearth checkers, etc.

Manufacturers now employ high refractory clay with a fusion point of 3100 degrees Fahr. for ladle stopper rods. The temperature of vitrification is 2600 degrees Fahr. and the porosity greater than 12 per cent, the speaker pointed out.

Insulation of open-hearth furnaces above the floor results in a decrease in radiation and minimizes infiltration. Mr. Leun did not recommend the insulation of furnace ends. Application of insulated roofs, he said, seasons the silica brick.

In conclusion, the speaker mentioned that deaired brick ultimately will replace silica brick in such places as the blast furnace stoves and open-hearth regenerators. He made a plea for close co-operation between the user and manufacturer of refractories.

OPINION that greatly improved results can be gained by applying the recuperative principle to furnaces of larger capacity is growing among steel men who seriously questioned such claims a few years ago, according to W. H. Fitch, manager recuperator department, Carborundum Co., Perth Amboy, N. J.

Use of the recuperative principle affords firing in one direction continuously and a constant flow of heat, thereby increasing the rate of furnace production to the maximum. The speaker also cited the fact that the principle requires the minimum amount of space for building and costs no more to build with superrefractories than a regenerator system for a given amount of work to be accomplished.

The silicon carbide tubular recuperator has been applied to about 70 industrial furnaces, in six basic industries including several continuous slab and billet reheating furnaces, the speaker pointed out. A description of a continuous strip mill heating furnace built with a silicon carbide tubular recuperator was presented in the Aug. 10, 1936 issue of STEEL.

DETAILS of a study of a phase of the design of the 1000-ton blast furnace now found in some Russian steel plants were presented by Gordon Fox, vice president, Freyn Engineering Co., Chicago. Many of the studies were presented in chart form and depicted the time required by the scale car for its movements and charging functions, time requirements for coke weighing and charging, and for skip hopper and bell movements.

T. J. KAUFFELD, special representative, DeLaval Separator Co., Pittsburgh, in speaking before the lubrication engineering division on "Centralized Lubrication and Roll Cooling Systems," pointed out that although a lubricant may have had the proper viscosity when new and placed in service, it will not retain this viscosity unless it is maintained properly as to cleanliness and limiting of temperature. This is due, he explained, to the gradual accumulation of foreign products in the oil.

A lubricating oil, he explained, should have sufficient adhesion and viscosity to enable it to stay in place when properly maintained but if it possesses greater viscosity than this, its power is wasted in shearing the oil. If the viscosity is less than that required, the speaker pointed out, metal-to-metal contact takes place eventually.

With special reference to the modern cold strip mills rolling at high speeds with heavy drafts, the speaker cited the importance of maintaining the roll contour and mentioned that this problem is becoming increasingly acute as larger mills are being built, making pos-

sible greater reductions per pass of the materials being rolled at high speeds.

A properly designed roll cooling system is one which can be so adjusted as to preserve the roll contour and yet apply the cooling and lubricating medium so that it will do its work most effectively and as economically as possible. This, the speaker explained, entails not only a proper selection of the type of cooling and lubricating medium to be employed but also the careful selection of the type of system for the proper application, maintenance or possible reclamation of this medium.

Incidents relating to the lubricating problems and difficulties encountered in the regular operations of various types of steel plant equipment were presened by C. J. Klein, chief engineer, Weirton Steel Co., Weirton, W. Va.

A PAPER on "Developments in Rolling Mills at the Ford Motor Company" by M. Stone, engineer, United Engineering & Foundry Co., Pittsburgh, and presented by John L. Young, service engineer of the United Company, mentioned that the reciprocating-type shear is highly satisfactory for cutting wide strip steel. Shears of this type have operated over a 9-month period 90 per cent of the time without delay.

Engineers at the present time are endeavoring to apply tension rolling to hot mill practice, the speaker announced. This should result in excellent control of the gage, he contended. Tension rolling at cold mills tends to produce flatter sheets, he pointed out. In skin pass mills arrangements now are being made for back tension.

Discussion brought out the fact that when two coils of strip are welded together the weld does not mark the rolls. The copper strip on the welding machine under the weld has to be replaced frequently but if kept in the proper shape the weld will be in good condition. The weld also withstands the drawing action on both the tandem and reversing type of cold mills.

THE trend in modern mills is to eliminate all the handling of coils and the waste of material due to loose ends. To accomplish this, a butt flash welder is used just ahead of the pickling vats. A suitable pit is provided to take up the slack in order to allow time for welding. The stock processing then is continuous right through pickling, cold rolling and cleaning, the cutting at the end being accomplished by flying shears. This was brought out in a paper entitled "Resistance Welding in Steel," by Walter Anderson, vice president, and Malcolm Clark, general manager, Taylor-Winfield Corp., Warren, O.

A modern installation of this type provides for the butt flash welding, transferring from welder to trimmer and subsequent trimming off the weld flash from both sides of the strip. The welders are of the latest automatic hydraulic type and give the operator full control of the welding operation. A starting lever is provided which when moved forward, opens a valve and starts the welding cycle. The upset slide moves forward at a predetermined speed with proper acceleration and when the flashing period is finished, the current automatically is cut off and the upset is made. The operation is entirely automatic yet the operator may reverse the machine at any time by movement of a controlled lever.

In conclusion, the authors pointed out that as far as the future is concerned, there is every indication that resistance welding will be used more and more for fabrication automatically, carrying with it the increased use of steel.

Glass Block Fills Dual Need In New Container Plant

(*Concluded from Page* 35)

tending 135 feet along the east side of this lofty storage room.

Eleven sets of narrow-gage track, set crosswise in the balcony and a 25-foot gallery alongside it, are equipped with dollies which receive roll paper from the crane and carry it to the primary feed machines in the corrugating line. This extends north along the gallery and paper passes through corrugating presses, pasters, a 75-foot drying oven and into cut-off shears, which slice the finished board to the desired lengths.

Continuing in the same straight line, the board passes through printing presses, slotting and scoring machines, and other folding tables to automatic machines which seal the box joints. Then the boxes move out on an automatic conveyor to tables where interior partitions are set in by hand. Ready for filling, they are then dropped on to a gravity conveyor which carries them to the ground floor for transfer either to the adjoining bottle plant where they are filled, or for shipment by rail or truck to one of the other middle-western plants of the company.

An office for the plant superintendent and clerical employes, with glass block partitions, stands at the point where the narrow gallery opens out into the main manufacturing area, which extends across the full width of the building and measures 337 feet, 6 inches in length. Columns spaced at 22 feet, 6-inch intervals down the center of the second floor support the roof over this section.

The bottle storage area, located on the first floor, directly below the box manufacturing layout, has been divided into bays by removable shapes and is equally accessible from the railroad siding along the west side of the building and the truck loading dock on the east. Special floors have been installed along the passages separating the storage bays, to withstand the steady wear from industrial trucks required to transport cartoned bottles to and from storage. A spandrel beam has been placed in this section of the building at a height of 9 feet, to permit the ultimate installation of a mezzanine for storage when necessary.

Arrangement Is Flexible

As the building stands, there is some flexibility in bottle storage capacity. Roll stops can be shifted into alternate sleeves set in the concrete floor slab, to confine the roll paper storage floor and allow the use of all the space below balcony and gallery for bottle storage as the occasion demands.

A paper baler, installed in a central position underneath the manufacturing floor, occupies a room in the middle of the bottle storage area, and draws paper scrap from the waste trim cutter in the corrugating line through a 10-inch duct. This duct also has a ventilating function and is connected with an exhaust air duct. Other scrap is conveyed to the baler through floor slots which empty into conveyor troughs.

Paste required for production of the corrugated board and boxes is pumped under pressure from three 10,000-gallon tanks located in a special concrete basement direct to the machines on the second floor, and circulates through direct return lines. The basement includes a silicate storage pit and dissolver where the company can make its own silica glue. The basement extends alongside the railroad siding where prepared pastes of silicates can be unloaded directly into storage tanks or bins.

Steam Leaks Waste Fuel

The power and heating engineer of a molding company has estimated that by the process of eliminating all previous steam leaks in the plant by oxyacetylene welding, the company's coal bill over the past year has been reduced by three carloads. This company has had its welding equipment in use on this type of maintenance for only one year.

THE *Rougher* THE TASK
THE *Better* OMEGA STEEL
SHOWS UP

BETHLEHEM Omega Tool Steel brings tremendous strength and toughness to rough-and-tumble tasks of every description. It's right at home under the terrific battering of pneumatic hammers. Once they've used it—seen its remarkable ability to stand up and take it—shop foremen won't consider any other steel for jobs where shocks are severe and oft-repeated. Omega bears up under service severe to the point of abuse that would break down ordinary tool steel in short order.

That's why it's no exaggeration to describe the physicals of this great shock-resisting steel as tremendous. Properly heat-treated, Omega Tool Steel develops a tensile strength of 340,000 lbs. per sq. in. in combination with an unnotched charpy value of 121 ft. lbs. With a slightly higher drawing temperature, the unnotched charpy value is stepped up still further with only a trifling reduction of tensile strength to 320,000 lbs. per sq. in.

Omega is unsurpassed as material for hand and pneumatic chisels, rivet sets and busters, blacksmith tools, beading tools, calking tools and punches and is widely used in shear blades. In heat treatment, Omega responds to a wider temperature range than carbon steels. No expensive equipment is needed. It forges readily betweeen 1850 and 1950 deg. F.

For other shop tasks, Bethlehem makes other tool steels equally outstanding in their respective fields.

BETHLEHEM
OMEGA
TOOL STEEL

BETHLEHEM STEEL COMPANY

NEW EQUIPMENT

Flue Gas Analyzer—

Hays Corp., Michigan City, Ind., announces the new Orsatomat, by means of which a sample of flue gas

Hays Orsatomat flue gas analyzer indicates per cent of carbon dioxide or oxygen present

may be analyzed in 20 seconds. It consists of a rotatable analyzing body which contains the measuring and absorption chambers and is charged with mercury and an absorbing chemical; the metallic bellows and linkage for moving the pointer; an aspirator bulb and the necessary rubber tubing; and a pressed steel case of special non-tipping design fitted with a convenient carrying handle. The Orsatomat is available in two models, a standard model for determination of carbon dioxide percentage and a twin unit model for determination of both carbon dioxide and oxygen content. No special training is required for its operation, percentages being shown directly on the scale.

• • •

Rotary Grinder—

Hanchett Mfg. Co., Big Rapids, Mich., announces a new rotary surface grinder. A one piece column supports a vertical motor-driven grinding head powered by a 30-horsepower enclosed fan-ventilated motor. Provision is made for down feed of wheel head either by hand or automatic means. The grinding wheel is of 20-inch diameter, 3 or 4 inches high with 2 or 3-inch grinding wheel face, of either cylinder or segmental type. The work table has a 36-inch diameter and an infinite range of speeds from ½ to 1½ revolutions per minute being driven from a Transitorq unit direct connected to a 2 horsepower motor. Tables are also furnished in the form of a 36-inch rotary magnetic chuck. The wheel dresser is built into the machine, an automatic sizing device compensates for wheel wear and an ammeter shows the performance of the motor. The coolant system is mounted in an auxiliary tank with a capacity of 150 gallons. Coolant is introduced to the grinding wheel and work at the center of the wheel, and auxiliary nozzles flow onto the work from the outside of the wheel. All electrical controls are located within the column and are built into the machine.

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De Walt semiautomatic metal cutting machine for continuous cutting of light wall tubing and similar materials

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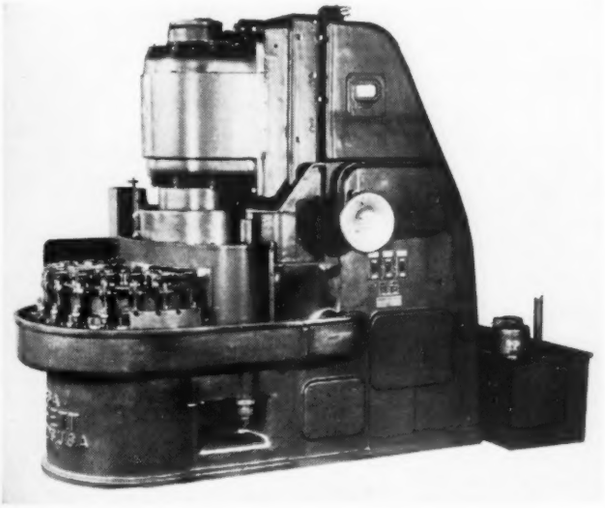

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One piece column supports the grinding head in this rotary surface grinder of the Hanchett Mfg. Co.

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Automatic Cutter—

DeWalt Products Corp., Lancaster, Pa., announces semiautomatic metal cutting machine for cutting any light section material which may be cut with saw blades. After material is manually started into the feed jaws, it is simultaneously clamped on both sides of the saw kerf by a four jaw automatic vise and then cut off. Saw then draws back, stock feed mechanism pushes another section of the material into the vise and the cycle is repeated. The machine was designed primarily for cutting

light wall tubing. It is equipped with a 7½ horsepower motor driving a 16-inch hollow ground saw blade at 3600 revolutions per minute. All mechanical actions are powered from a single horsepower motor driving through a variable speed V-belt pulley and equipped with a slip clutch so that the machine action is under convenient control of the operator at all times. The machine is completely guarded and provision has been made to keep the chips and grit out of the working parts. Three control stations are provided, each station controlling both motors.

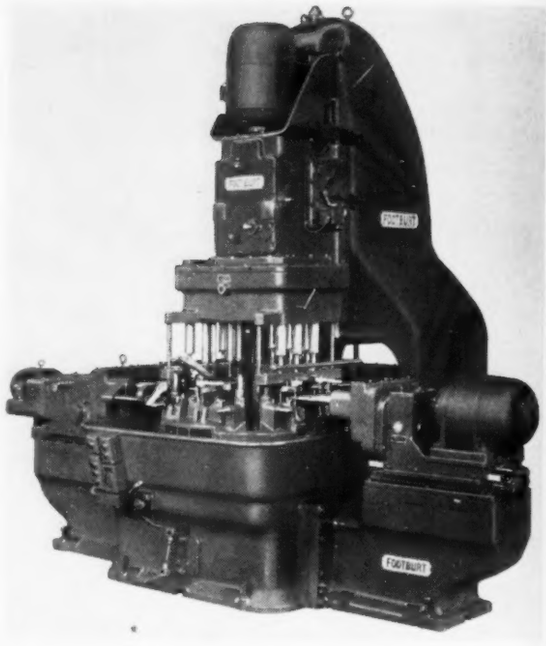
♦ ♦ ♦

Safety Goggles—

American Optical Co., Southbridge, Mass., announces an addition to its line of eye protection equipment, to be known as the F-3105 Ful-Vue goggle. Safety features of

New safety goggles designed by American Optical Co., with non-corrosive mesh guards

the new goggles include high end-pieces, 6-curve super armorplate lenses, self-adjusting nose pads and side shields. The shields are of non-corrosive wire mesh screens and are easily cleaned. The mesh is sufficiently fine to prevent the passage of flying particles, but does not prohibit free circulation of air, it is claimed. Metal frames are non-corrosive and are available in a wide variety of bridge sizes.

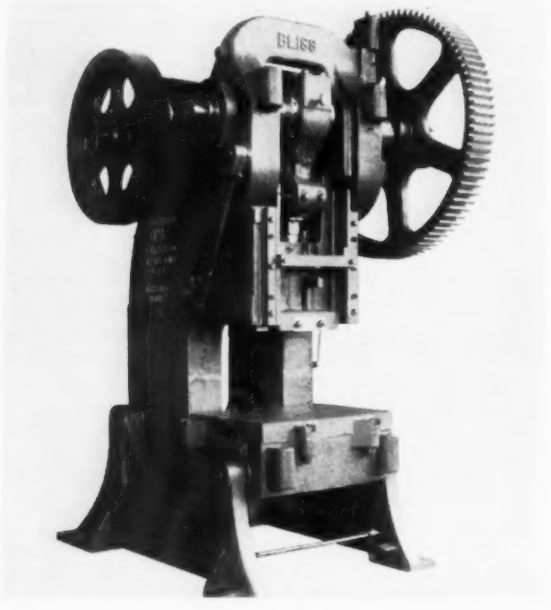


Foote-Burt combination drilling and tapping machine used in drilling, chamfering and tapping an automotive part

♦ ♦ ♦

Combination Drilling and Tapping Machine—

Foote-Burt Co., Cleveland, has recently built a new 4-way, 25-spindle combination drilling and tapping machine which is to be used in drilling, chamfering and tapping an automotive part. There are four heads. The upper, left hand and rear heads are mounted on hydraulic feed drilling units. Upper unit has ways 16 inches wide and the left and rear units have 10-inch ways. The right head is mounted on a lead screw tapping unit and has 10-inch ways. All units are electrically controlled and are started by means of a pushbutton. Each unit goes through its individual cycle and returns to the starting point until restarted. The fixtures for holding the parts being machined are mounted on a 4-position circular indexing table, three parts being loaded at each station. The upper head performs three operations on each part; drilling at the second station, boring at the third station and line reaming at the fourth. In each cycle of the machine the heads perform six separate operations on each part.



Consolidated inclinable press operating at a rate of 40 strokes per minute

♦ ♦ ♦

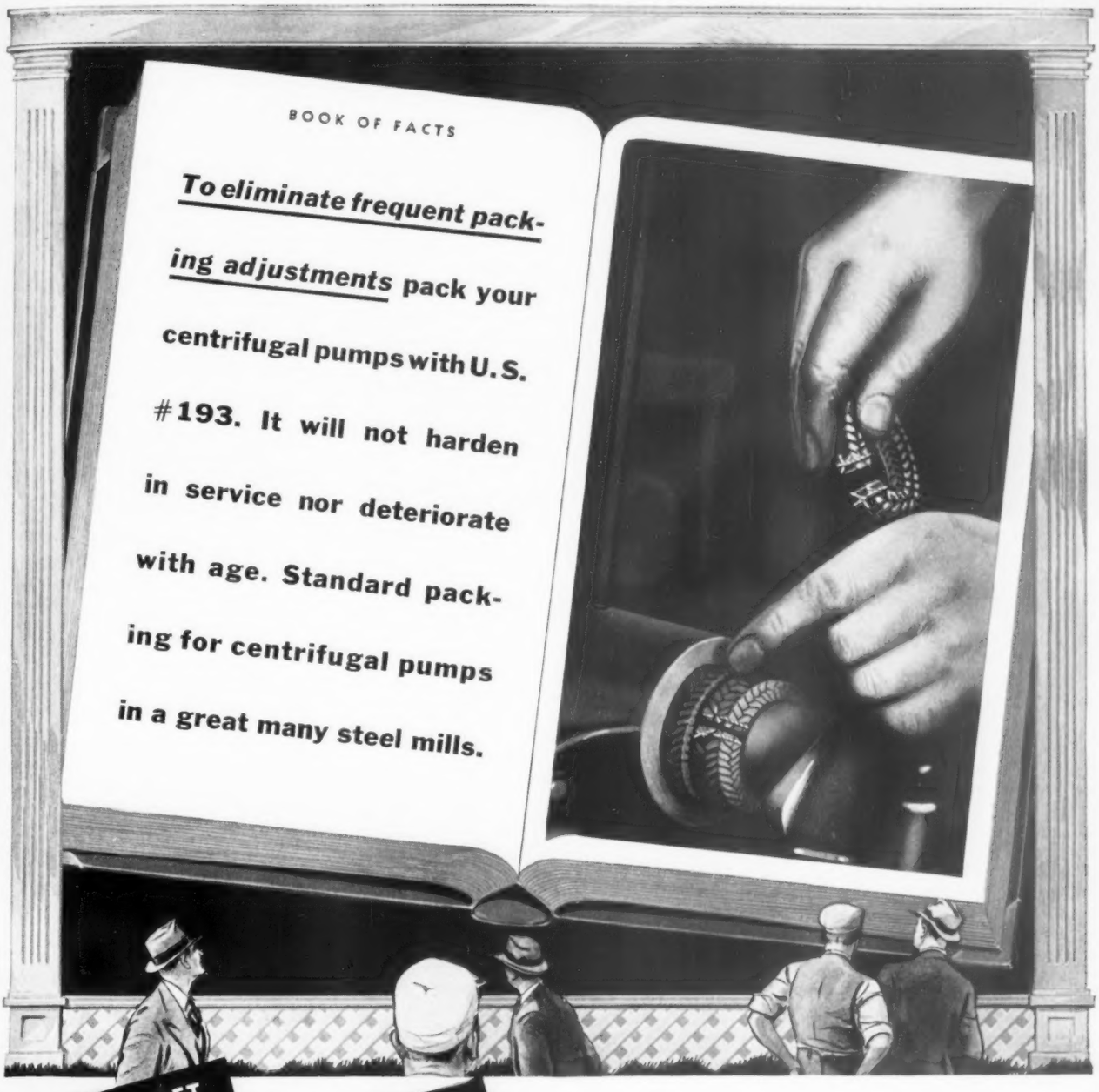
Inclinable Press—

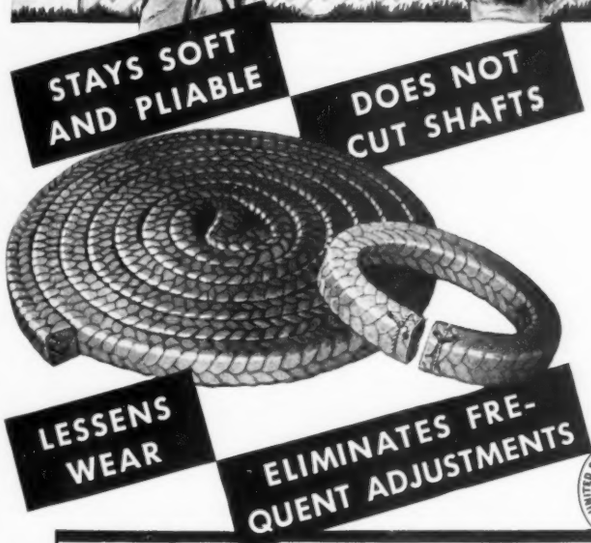
E. W. Bliss Co., Brooklyn, N. Y., is offering a new heavy duty-adjustable stroke inclinable press, built by the Consolidated Press division, Hastings, Mich. The press is single geared and is aranged for direct connected motor drive. Latest designs in jaw and fast rolling key clutches are offered to suit the service requirements. Timken roller bearings and bronze bushed main and crankpin bearings are used. Stroke is adjustable for 2, 4 or 6 inches, with die spaces of 19, 18 and 17 inches respectively. The adjustable eccentric is locked rigidly in place by a rolling key device and the adjustment is easy and convenient to make. Machine operates at 40 strokes per minute.

♦ ♦ ♦

Rotary Dryer—

Link-Belt Co., 307 North Michigan avenue, Chicago, announces an improved rotary louvre dryer for drying granular materials, coal, crystals, chemicals, powders refuse and the like. The dryer consists of a horizontal drum with closed ends and a series of internal channels


BOOK OF FACTS
To eliminate frequent packing adjustments pack your centrifugal pumps with U. S. #193. It will not harden in service nor deteriorate with age. Standard packing for centrifugal pumps in a great many steel mills.

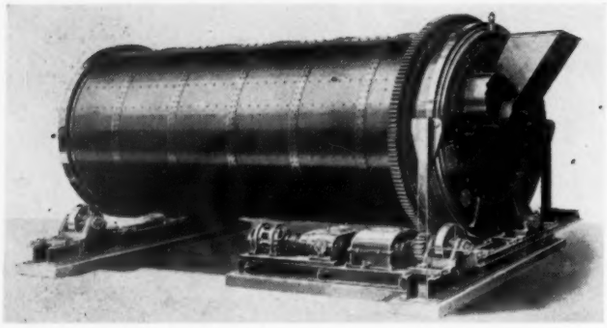


FOR lower operating costs, reduced wear on rods, and longer packing life — use U. S. #193 Centrifugal Pump Packing. Each of the long fibre asbestos strands is lubricated and graphited *before braiding* with the highest quality wax-free lubricants.

U. S. #193 is braided to the proper density and accurately sized. Specify U. S. #193 for dependable and economical centrifugal pump packing. Order it today.

United States Rubber Company

United States Rubber Products, Inc., New York, N. Y.



Link Belt Rotary louvre dryer for drying or cooling granular materials

near the circumference into which hot air is admitted by a fan. The channels are covered by tangential plates which overlap in such a way as to leave a gap for hot air to pass from the channels into the interior of the drum and through the material, and to prevent any material from falling backward into the channels. The material to be dried is supplied to the feed hopper at the receiving end of the drum and gradually travels to the discharging end because of the rotation of the drum and the tapering of the channels. The unit may also be used as a cooler by introducing a cooling blast in place of the hot air.

Relating Gear Unit Loads and Stresses

(*Concluded from Page* 40)

a torsional flexibility over the critical range.

Speed reducer parts in frequent reversing, starting and stopping service are often overstressed due to a coupling of excessive backlash and sometimes can be corrected by elimination of the coupling backlash or selection of a coupling with sufficient torsional flexibility to absorb the shock load.

The prime mover must be considered as to type and overload capacity and duty cycle in relation to the driven equipment and the load imposed by the driven equipment. If the prime mover, due to design or operating characteristics, imposes an impact load of a high magnitude and frequency, the speed reducer must be selected capable of withstanding the peak loads or a coupling having a torsional flexibility capable of absorbing or reducing peak loads must be used between the speed reducer and the prime mover.

Prime Movers Specified

The principal types of prime movers are gas, oil, or steam engines, and electric motors, of which there are several types. Single and multicylinder engines, due to their inherent characteristics, have torques of different magnitude and frequency. Electric motors of different types are capable of different torque conditions.

Fig. 5 represents the speed-torque curves of most of the induction motors in use. Although all motors as represented on these curves have the same nominal horsepower rating, the starting torques vary from 75 to 225 per cent of the full load torque. The pullout or brake down torque varies from 150 to 300 per cent of the full load torque, which also is an indication of the overload capacity for intermittent peaks.

As an illustration, consider a speed reducer driving a punch press, the speed reducer being driven by an electric motor. Some punch presses employ the use of a large slow-speed flywheel mounted directly on the machine and some employ a small flywheel mounted on the high speed shaft of the speed reducer. Although the application in general is the same in both cases and the rating of the motor may be the same, the load imposed on the speed reducer is entirely different. It would be impossible for the speed reducer manufacturer to include both types of machine drives with a common application factor. Therefore, the type of load imposed on the speed reducer becomes the criterion of the application factor.

The first case employing a large flywheel could be selected from the manufacturer's catalog rating table with the use of a suitable application factor. The second case employing a smaller flywheel on the high-speed shaft can also be selected from the manufacturer's catalog rating table if the following are known and considered in the selection: (1) Power required by the punch press to do the work intended, or (2) energy of the rotating parts about the high-speed shaft, and (3) drop in speed during the work cycle.

The energy of the rotating parts about the high-speed shaft may be converted into horsepower and added to the motor horsepower. The total horsepower input and the use of the application factor for the type of service will permit the proper selection of the speed reducer. The speed reducer manufacturer's list of application factors may not include the particular application factor, but an application factor for similar type of load and duty cycle can often be employed if the application is properly analyzed.

Fig. 6 represents an assumed extreme continuous-duty cycle plotted from actual motor test performance curves. The squirrel cage motor has a torque curve similar to a Class B as shown on Fig. 5. The wound-rotor motor has a torque curve similar to the wound rotor as shown on Fig. 5. The duty cycle is based on the assumption that the heating of the motor is proportional to the square of the output. While this is not strictly correct, it is close enough.

This curve is plotted merely to show to some degree the overloads that can be imposed on speed reducers by electric motors at times, and the motor still not exceed the temperature rating. The duty cycle for the squirrel cage motor would be 5 horsepower normal or 22.4 pounds feet torque, peak loads of 70 pounds feet of ½ minute duration, occurring every 4½ minutes. The duty cycle for the wound rotor motor would be 5 horsepower normal or 22.4 pounds feet torque, peak loads of 97 pounds feet of ½ minute duration, occurring every 15 minutes.

Peak Loads of Motors

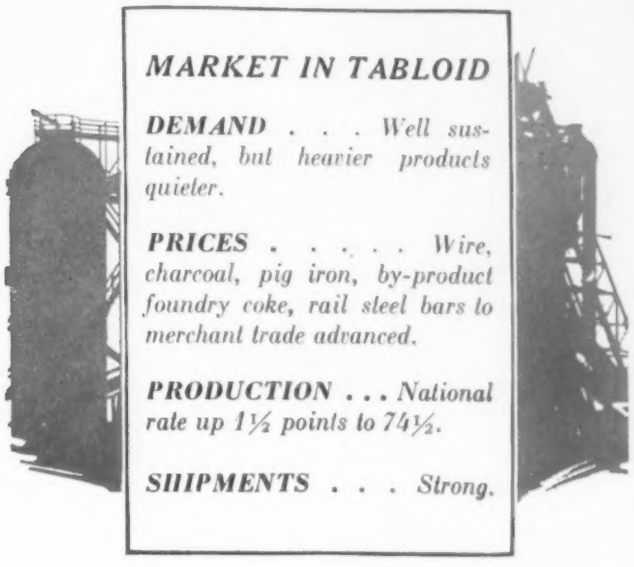
The peak loads imposed on the squirrel cage motor are equal to 155 per cent of the normal continuous rating occurring every 4½ minutes. The peak loads imposed on the wound-rotor motor are equal to 216 per cent of the normal intermittent rating, occurring every 15 minutes.

Speed reducers selected for a duty cycle as previously shown should be selected on the basis of the peak loads as the continuous load rather than the normal motor rated load.

A speed reducer will fail when some part is overstressed; this may be the gears, shafts, or bearings, depending on the part that is the basis of rating at that particular speed and ratio. Gear teeth may fail due to tooth breakage, indicating fatigue, due to excessive bending stress from shock, or by progressive pitting, indicating high compressive stresses. Pitting may start in a couple of hours of operation and ruin the gears in a very short time or the pitting may be gradual, shortening the gear life. Shafts fail due to fatigue caused by high stresses. Bearings may fail in a short time or may run for months, depending entirely on the stress imposed on them.

Final Quarter Begins with Rate at 74½

Auto Production Increasing; Finished Steel Prices Up



MARKET IN TABLOID

DEMAND . . . *Well sustained, but heavier products quieter.*

PRICES . . . . . *Wire, charcoal, pig iron, by-product foundry coke, rail steel bars to merchant trade advanced.*

PRODUCTION . . . *National rate up 1½ points to 74½.*

SHIPMENTS . . . *Strong.*

WITH aggregate demand well sustained, automobile production on the upswing again and orders for finished material being booked at the new prices, steelworks operations last week increased 1½ points to 74½ per cent, highest since May, 1930.

September output of steel ingots placed 1936 production ahead of that for 1930 and unless unforeseen difficulties arise the lead will be maintained for the rest of the year. With September estimated, nine-months' output of steel ingots is 33,395,196 gross tons, 38 per cent greater than the 24,051,412 tons produced in the first nine months of 1935.

Comparisons for the nine-month period, with September estimated, include: Automobiles—nine-months' assemblies 3,300,000, compared to 2,875,304 in the 1935 period; rail awards—83 per cent ahead of last year, totaling 554,700 tons compared to 302,006 in 1935; Lake Superior iron ore—shipments 48 per cent ahead of last year with September's 7,000,000 tons bringing the total to 33,281,517, compared to 22,204,213 tons in the nine months last year; freight car awards—40,933 at the end of the third quarter, compared to 7908 last year, a gain of 400 per cent; shape awards—about 900,000 tons, compared to 634,400 in 1935.

Pig iron output in September, 2,729,705 gross tons, represented a gain of .66 per cent over the 2,711,726 tons produced in August. The nine months' total, 21,617,224 tons, is an increase of 6,736,909 tons or 45.2 per cent over the same period last year. Average daily pig iron production in September was 90,991 tons, compared to 87,475 in August, a gain of 4 per cent. Stacks active at the end of September totaled 154, a gain of six.

Deliveries have become more and more a problem recently for sheet producers with their unusually heavy backlogs. Bar mills, also with orders piled up, are three to four weeks behind on shipments. Flat-rolled steel deliveries vary, strip being available in two or three weeks. Cold-finished bar producers are booked heavily. The heavy products have been quieter than they were earlier in the year.

In tin plate, where operations have been close to capacity all year with no summer slump, virtually all the cold-reduced and hot mills are operating at full capacity and beginning to prepare for the rolling of 1937 plate.

Reflecting the price advances which went into effect Oct. 1, STEEL'S composite of finished steel quotations is up 90 cents to $53.90, about even with August, 1935. Among the Oct. 1 advances, increases ranging from 50 cents to $3 a ton went into effect on various wire products. All grades of Lake Superior charcoal pig iron have been advanced 50 cents a gross ton and by-product foundry coke prices 50 cents a ton along the eastern seaboard. Rail steel bars to the merchant trade are up $2 a ton. STEEL'S composite of iron and steel prices is now $34.62, up 43 cents.

For the third week, STEEL'S scrap composite remains at $16.54, yet demand is fairly strong in most districts and supplies have been coming out freely. Shipping restrictions have contributed to the weakness of some grades of remelting material.

Automobile production last week increased 7120 units to 22,800. More steel is being used in the 1937 models than ever before. New ribbed members for doors and side panels will add 50 to 60 pounds of steel to each car in some lines. Replacement of soft tops with steel will result in 50 to 60 more pounds.

With the rolling of old orders near an end, new business for rail mills has yet to make its appearance. Some railroad car shops are busy trying to make more open top cars available for use this winter when coal traffic will be heavy.

Operating rates were up in four districts: Pittsburgh, where the increase was 1 point to 75 per cent; Chicago 1 to 74; eastern Pennsylvania ½ to 49, and Cleveland 1½ to 82. No changes were reported from the other districts.

Shape awards were up 7000 tons to 19,345, while reinforcing steel fell off 8000 tons to 3258.

In the Chicago district pig iron sellers have accumulated the heaviest backlogs of the year to date, with some foundries apparently anticipating their needs well in advance. Although there is some talk of a possible price advance late this year, the principal reason for the backlogs is believed to be the improved consumption in sight for the ensuing three months.

COMPOSITE MARKET AVERAGES

	Oct. 3	Sept. 26	Sept. 19	One Month Ago Sept., 1936	Three Months Ago July, 1936	One Year Ago Oct., 1935	Five Years Ago Oct., 1931
Iron and Steel	$34.62	$34.19	$34.22	$34.15	$33.49	$32.84	$30.30
Finished Steel	53.90	53.00	53.00	53.10	53.40	53.70	48.22
Steelworks Scrap..	16.54	16.54	16.54	16.18	12.89	12.72	8.50

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	Oct. 3 1936	Sept. 1936	July 1936	Oct. 1935
Finished Material				
Steel bars, Pittsburgh	2.05c	1.95c	1.95c	1.85c
Steel bars, Chicago	2.10	2.00	2.00	1.90
Steel bars, Philadelphia	2.36	2.26	2.26	2.16
Iron bars, Terre Haute, Ind.	1.95	1.85	1.85	1.75
Shapes, Pittsburgh	1.90	1.90	1.90	1.80
Shapes, Philadelphia	2.11½	2.11½	2.11½	2.01½
Shapes, Chicago	1.95	1.95	1.95	1.85
Tank plates, Pittsburgh	1.90	1.90	1.90	1.80
Tank plates, Philadelphia	2.09	2.09	2.09	1.99
Tank plates, Chicago	1.95	1.95	1.95	1.85
Sheets, No. 10, hot rolled, Pitts.	1.95	1.95	1.95	1.85
Sheets, No. 24, hot ann., Pitts.	2.60	2.50	2.50	2.40
Sheets, No. 24, galv., Pitts.	3.20	3.20	3.20	3.10
Sheets, No. 10, hot rolled, Gary	2.05	2.05	2.05	1.95
Sheets, No. 24, hot anneal., Gary	2.70	2.60	2.60	2.50
Sheets, No. 24, galvan., Gary	3.30	3.30	3.30	3.20
Plain wire, Pittsburgh	2.50	2.40	2.40	2.30
Tin plate, per base box, Pitts.	5.25	5.25	5.25	5.25
Wire nails, Pittsburgh	2.05	1.95	2.10	2.40
Semifinished Material				
Sheet bars, open-hearth, Youngs.	$32.00	30.00	30.00	28.00
Sheet bars, open-hearth, Pitts.	32.00	30.00	30.00	28.00
Billets, open-hearth, Pittsburgh	32.00	30.00	30.00	27.00
Wire rods, Pittsburgh	38.00	38.00	38.00	38.00

	Oct. 3 1936	Sept. 1936	July 1936	Oct. 1935
Pig Iron				
Bessemer, del. Pittsburgh	$20.8132	20.8132	20.8132	19.81
Basic, Valley	19.00	19.00	19.00	18.00
Basic, eastern del. East. Pa.	20.8132	20.8132	20.8132	19.81
No. 2 fdy., del. Pittsburgh	20.3132	20.3132	20.3132	19.31
No. 2 fry., Chicago	19.50	19.50	19.50	18.75
Southern No. 2, Birmingham	15.50	15.50	15.50	14.50
Southern No. 2, del. Cincinnati	19.44	19.44	20.2007	19.38
No. 1 2X eastern, del. Phila.	21.6882	21.6882	21.6882	20.68
Malleable, Valley	19.50	19.50	19.50	18.50
Malleable, Chicago	19.50	19.50	19.50	18.75
Lake Sup., charcoal, del. Chicago	25.7528	25.2528	25.2528	24.90
Ferromanganese, del. Pitts	80.13	80.13	80.13	90.13
Gray forge, del. Pittsburgh	19.6741	19.6741	19.6741	18.67
Scrap				
Heavy melting steel, Pittsburgh	$18.25	17.75	14.15	13.65
Heavy melt. steel, No. 2, east. Pa.	14.25	14.00	11.50	11.00
Heavy melting steel, Chicago	16.25	16.15	13.25	12.50
Rail for rolling, Chicago	16.75	16.75	14.00	14.00
Railroad steel specialties, Chicago	17.75	17.65	14.75	13.50
Coke				
Connellsville, furnace, ovens	$4.00	3.90	3.45	3.55
Connellsville, foundry, ovens	4.25	4.25	4.25	4.35
Chicago, by-product foundry, del.	9.75	9.75	9.75	9.75

Steel, Iron, Raw Material, Fuel and Metals Prices

Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week

Sheet Steel

Prices Subject to Quantity Extras and Deductions (Except Galvanized)

Hot Rolled No. 10, 24-48 in.

Pittsburgh	1.95c
Gary	2.05c
Chicago, delivered	2.08c
Detroit, del.	2.15c
New York, del.	2.30c
Philadelphia, del.	2.26c
Birmingham	2.10c
St. Louis, del.	2.28c
Pacific ports, f.o.b. cars, dock	2.50c

Hot Rolled Annealed No. 24

*Pittsburgh	2.60c
*Gary	2.70c
*Chicago, delivered	2.73c
*Detroit, delivered	2.80c
*New York, del.	2.95c
*Philadelphia, del.	2.91c
*Birmingham	2.75c
*St. Louis, del.	2.935c
*Pacific ports, f.o.b. cars, dock	3.25c

Galvanized No. 24

Pittsburgh	3.20c
Gary	3.30c
Chicago, delivered	3.33c
Philadelphia, del.	3.51c
New York, del.	3.55c
Birmingham	3.35c
St. Louis, del.	3.53½c
Pacific ports, f.o.b. cars, dock	3.80c

Tin Mill Black No. 28

Pittsburgh	2.75c
Gary	2.85c
St. Louis, delivered	3.08c

Cold Rolled No. 10

Pittsburgh	2.60c
Gary	2.70c
Detroit, delivered	2.80c
Philadelphia, del.	2.91c
New York, del.	2.95c
Pacific ports, f.o.b. cars, dock	3.20c

Cold Rolled No. 20

Pittsburgh	3.05c
Gary	3.15c
Detroit, delivered	3.25c
Philadelphia, del.	3.36c
New York, del.	3.40c

Enameling Sheets

Pittsburgh, No. 10	2.45c
Pittsburgh, No. 20	3.05c
Gary, No. 10	2.55c
Gary, No. 20	3.15c

Tin and Terne Plate

Gary base, 10 cents higher.

Tin plate, coke base (box) Pittsburgh	$5.25
Do., waste-waste	2.75c
Do., strips	2.50c
Long ternes, No. 24 unassorted, Pitts.	3.50c
Do., Gary	3.60c

Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

Chrome-Nickel

	No. 302	No. 304
Bars	23.00	24.00
Plates	26.00	28.00
Sheets	33.00	35.00
Hot strip	20.75	22.75
Cold strip	27.00	29.00

Straight Chromes

	No. 410	No. 430	No. 442	No. 446
Bars	17.00	18.50	21.00	26.00
Plates	20.00	21.50	24.00	29.00
Sheets	25.00	28.00	31.00	35.00
Hot strip	15.75	16.75	21.75	26.75
Cold stp.	20.50	22.00	27.00	35.00

Steel Plate

Pittsburgh	1.90c
New York, del.	2.19c
Philadelphia, del.	2.09c
Boston, delivered	2.32c
Buffalo, delivered	2.15c
Chicago or Gary	1.95c
Cleveland, del.	2.09½c
Birmingham	2.05c
Coatesville, base	2.00c
Sparrows Pt., base	2.00c
Pacific ports, f.o.b. cars, dock	2.45c
St. Louis, delivered	2.18c

Structural Shapes

Pittsburgh	1.90c
Philadelphia, del.	2.11½c
New York, del.	2.16¼c
Boston, delivered	2.30½c
Bethlehem	2.00c
Chicago	1.95c
Cleveland, del.	2.10c
Buffalo	2.00c
Gulf Ports	2.30c
Birmingham	2.05c
Pacific ports, f.o.b. cars, dock	2.45c

Bars

Soft Steel

(Base, 3 to 25 tons)

*Pittsburgh	2.05c
*Chicago or Gary	2.10c
*Duluth	2.20c
*Birmingham	2.20c
*Cleveland	2.10c
*Buffalo	2.15c
*Detroit, delivered	2.20c
*Pacific ports, f.o.b. cars, dock	2.60c
*Philadelphia, del.	2.36c
*Boston, delivered	2.47c
*New York, del.	2.40c
*Pitts., forg. qual.	2.40c

Rail Steel

To Manufacturing Trade

*Pittsburgh	1.90c
*Chicago or Gary	1.95c
*Moline, Ill.	1.95c
Cleveland	1.85c
Buffalo	1.90c

Iron

Terre Haute, Ind.	1.95c
Chicago	2.00c
Philadelphia	2.26c
Pittsburgh, refined	2.75-7.50c

Reinforcing

New billet, straight lengths, quoted by distributors.

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young.	2.10c
Gulf ports	2.45c
Pacific coast ports f.o.b. car docks	2.45c
Philadelphia, del.	2.26c-2.36c

Rail steel, straight lengths, quoted by distributors

Pittsburgh	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.	1.95c
Gulf ports	2.30c

Wire Products

(Prices apply to straight or mixed carloads; less carloads $4 higher; less carloads fencing $5 over base column.)

Base Pitts.-Cleve. 100 lb. keg.	
*Standard wire nails	2.05c
*Cement coated nails	2.05c
Galv. nails, 15 gage and finer	3.05c
do. finer than 15 ga.	4.55c

(Per pound)

*Polished staples	2.75c
*Galv. fence staples	3.00c
*Barbed wire, galv.	2.55c
*Annealed fence wire	2.80c
*Galv. fence wire	3.15c
*Woven wire fencing (base column, c. l.)	$60.00

To Manufacturing Trade

†Plain wire, 6-9 ga.	2.50c

Anderson, Ind. (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire, Pitts.

* or Cleveland	3.15c

Do., Chicago up $1, Worc. $2.

Cold-Finished Carbon Bars and Shafting

*Base, Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.	2.35c
20,000 to 59,999 lbs.	2.30c
60,000 to 99,999 lbs.	2.25c
100,000 lbs. and over	2.22½c

Gary, Ind., Cleve., Chi., up 5c; Buffalo, up 10c; Detroit, up 15c; eastern Michigan, up 20c.

Alloy Steel Bars (Hot)

(*Base, 3 to 25 tons*)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem	2.55c

Alloy S.A.E.	Diff.	Alloy S.A.E.	Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 0.15 to 0.25 Mo.	0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni	1.05
5100 0.80-1.10 Cr.	0.45
5100 Cr. spring	base
6100 bars	1.20
6100 spring	0.70
Cr., Ni., Van.	1.50
Carbon Van.	0.95
9200 spring flats	base
9200 spring rounds, squares	0.25

Piling

Pittsburgh	2.25c
Chicago, Buffalo	2.35c

Strip and Hoops

(Base, hot rolled, 25-1 ton)
(Base, cold-rolled, 25-3 tons)

Hot strip to 23/8-in.	
Pittsburgh	1.95c
Chicago or Gary	2.05c
Birmingham base	2.10c
Detroit, del.	2.15c
Philadelphia, del.	2.26c
New York, del.	2.30c
Cooperage hoop,	
Pittsburgh	2.05c
Chicago	2.15c
Cold strip, 0.25 carbon and under,	
Pitts., Cleveland	2.60c
Detroit, del.	2.81c
Worcester, Mass.	2.80c

Carbon	Cleve-Pitts.	Worcester, Mass.
*0.26—0.50	2.60c	2.80c
*0.51—0.75	3.70c	3.90c
*0.76—1.00	5.45c	5.65c
*Over 1.00	7.50c	7.70c

Rails, Track Material

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts. 20—100 lbs.	25.50-28.00
Light rails, billet qual. Pitts., Chi.	$35.00
Do., reroll. qual.	34.00
Angle bars, billet, Gary, Ind., So. Chi.	2.55c
Do., axle steel	2.10c
Spikes, R. R. base	2.75c
Track bolts, base	3.75c
Tie plates, base	2.00c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $2; 16 and 20 lbs., up $1; 12 lbs. up $2; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade as per Dec. 1, 1932, lists:

Carriage and Machine

½ x 6 and smaller	70-10 off
Do. larger	70-5 off
Tire bolts	50 off

Plow Bolts

All sizes	70-5 off

Stove Bolts

In packages with nuts attached 75 off; in packages with nuts separate 75-5 off; in bulk 82½ off on 15,000 of 3-inch and shorter, or 5000 over 3-inch.

Step bolts	65 off
Elevator bolts	65 off

Nuts

S. A. E. semifinished hex.: ½ to ⅞-inch	60-20-15 off
Do., ½ to 1-inch	60-20-15 off
Do., over 1-inch	60-20-15 off

Hexagon Cap Screws

Milled	80-10-10 off
Upset, 1-in., smaller	85 off

Square Head Set Screws

Upset, 1-in., smaller	75-10 off
Headless set screws	75 off

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.05c
Struc., c. l., Chicago	3.15c
⅞-in. and smaller, Pitts., Chi., Cleve.	70-5 off
Wrought washers, Pitts., Chi., Phila. to jobbers and large nut, bolt mfrs.	$6.25 off

Cut Nails

Cut nails, Pitts.; (10% discount on size extras)	$2.90
Do. less carloads, 5 kegs or more, no discount on size extras	$3.20
Do. under 5 kegs; no disc. on size extras	$3.35

Pipe and Tubing

Base $200 net ton, except on less boiler tubes under 2 inches and cold drawn seamless.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less, Chicago, del. 2½ less. Wrought pipe, Pittsburgh.

Butt Weld

Steel

In.	Blk.	Galv.
⅛ and ¼	60	44½
⅜	64½	55
½	67½	59
¾	69½	61½
1—3	31½	15

Iron

⅛	36½	20½
¼	39½	25½
⅜	41½	26
½	62	53½
¾	65	56½
1—1¼	67	58½
1½	66	56½
2	65½	56

Iron

⅛	37	22½
¼	38	25
⅜	40	28½

Lap Weld

Steel

2	62
2½—3	65
3½—6	67
7 and 8	66
9 and 10	65½

Iron

2	37
2½—3½	38
4—8	40

Line Pipe

Steel

⅛, butt weld	56
¼ and ⅜, butt weld	59
½, butt weld	63½
¾, butt weld	66½
1 to 3, butt weld	68½
2, lap weld	61
2½ to 3, lap weld	64
3½ to 6, lap weld	66
7 and 8, lap weld	65

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

Boiler Tubes

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		Charcoal Iron	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3½—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential; of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 pts. under base.

Seamless Boiler Tubes

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935, card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices being on lb. and 100 ft. basis.

Seamless Tubing

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.	32%
15,000 ft. or 22,500 lbs.	70%

Cast Iron Water Pipe

Class B Pipe—Per Net Ton

6-in. & over, Birm.	$39.00-40.00
4-in., Birmingham	42.00-43.00
4-in., Chicago	50.40-51.40
6 to 24-in. Chicago	47.40-48.40
6-in. & over, east. fdy.	43.00
Do. 4-in.	46.00

Class A pipe $3 over Class B Stnd. fittgs., Birm. base $100.00

Semifinished Steel

Billets and Blooms

4 x 4-inch base; gross ton

†Pitts., Chi., Cleve., Buffalo & Young.	$32.00
†Philadelphia	37.67
†Duluth	34.00

Forging Billets

6 x 6 to 9 x 9-in., base

†Pitts., Chi., Buff.	39.00
†Forging, Duluth	41.00

Sheet Bars

†Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt.	32.00

Slabs

Pitts., Chi., Cleve., Young.	30.00

Wire Rods

Pitts., Cleve., No. 5 to ⅝-inch incl.	40.00
Do., over ⅝ to ⅞-inch incl.	42.00

Chicago up $1; Worcester up $2

Skelp

Pitts., Chi., Young., Buff., Coatesville, Sparrows Point	1.80c

Coke

Price Per Net Ton

Beehive Ovens

Connellsville, fur.	$3.75- 4.00
Connellsville, fdry.	4.25- 4.50
Connel. prem. fdry.	5.50
New River fdry.	6.00
Wise county fdry.	4.45- 5.00
Wise county fur.	4.00- 4.50

By-Product Foundry

Newark, N. J., del.	10.20-10.65
Chi., ov., outside del.	9.00
Chicago, del.	9.75
New England, del.	11.50-12.00
St. Louis, del.	10.00-10.50
Birmingham, ovens	6.50
Indianapolis, del.	9.40
Cincinnati, del.	9.50
Cleveland, del.	9.75
Buffalo, ovens	7.50- 8.00
Detroit, ov., out. del.	9.00
Philadel, del.	9.88

Coke By-Products

Spot gal. Producers' Plants

Pure and 90% benzol	16.00c
Toluol	30.00c
Solvent naphtha	30.00c
Industrial xylol	30.00c

Per lb. f.o.b. Frankford,

Phenol (200 lb. drums)	15.50c
Do. (450 lbs.)	14.50c

Eastern Plants, per lb.

Naphthalene flakes and balls, in bbls., to jobbers	7.25c

Per 100 lbs. Atlantic seaboard

Sulphate of ammonia	$1.275

†Western prices, ½-cent up

Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$20.50	$21.00	$20.00	$21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Birmingham, Ala., southern del.	15.50	15.50	14.50	21.00
Buffalo	19.50	20.00	18.50	20.50
Chicago	19.50	19.50	19.00	20.00
Cleveland	19.50	19.50	19.00	20.00
Detroit	19.50	19.50	19.00	20.00
Duluth	20.00	20.00	....	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Everett, Mass	20.50	21.00	20.00	21.50
Hamilton, O.	19.50	19.50	19.00	....
Jackson, O.	20.25	20.25	19.75	....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Provo, Utah	17.50	....	17.00	....
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Sparrows Point, Md.	20.50	....	20.00	....
Swedeland, Pa.	20.50	21.00	20.00	21.50
Toledo, O.	19.50	19.50	19.00	20.00
Youngstown, O.	19.50	19.50	19.00	20.00
Delivered from Basing Points:				
Akron, O., from Cleveland	20.76	20.76	26.26	21.26
Baltimore from Birmingham	21.08	....	19.96	....
Boston from Birmingham	20.62	....	20.50	....
Boston from Everett, Mass.	21.00	21.50	20.50	22.00
Boston from Buffalo	21.00	21.50	20.50	22.00
Brooklyn, N. Y., from Bethlehem	22.93	23.43	....	....
Brooklyn, N. Y., from Bmghm.	22.55	....	....	....
Canton, O., from Cleveland	20.76	20.76	20.26	21.26
Chicago from Birmingham	†19.72	....	19.60	....
Cincinnati from Hamilton, O.	19.82	20.58	20.08	....
Cincinnati from Birmingham	19.44	....	18.44	....
Cleveland from Birmingham	19.62	....	19.12	....
Indianapolis from Hamilton, O.	21.17	21.77	21.27	....
Mansfield, O., from Toledo, O.	21.26	21.26	20.76	21.76
Milwaukee from Chicago	20.57	20.57	20.27	21.07
Muskegon, Mich., from Chicago, Toledo or Detroit	22.60	22.60	22.10	23.10
Newark, N. J., from Birmingham	21.61	....	....	....
Newark, N. J., from Bethlehem	21.99	22.49	....	....
Philadelphia from Birmingham	20.93	....	20.81	....
Philadelphia from Swedeland, Pa.	21.31	21.81	20.81	....
Pittsburgh district from Neville Island	Neville base plus 67c, 81c and $1.21 switching charges			
Saginaw, Mich., from Detroit	21.75	21.75	21.25	21.25
St. Louis, northern	20.00	20.00	19.50	....

Delivered from Basing Points:	No. 2 Fdry.	Malleable	Basic	Bessemer
St. Louis from Birmingham	†19.68	....	19.50	....
St. Paul from Duluth	21.94	21.94	....	22.44

†Over 0.70 phos.

Low Phos.

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $24.00, Phila. base, standard and copper bearing, $25.13.

Gray Forge		Charcoal	
Valley furnace	19.00	Lake Superior fur.	$22.50
Pitts. dist. fur.	19.00	Do., del. Chicago	25.75
		Lylees, Tenn.	22.50

Silvery†

Jackson county, O., base; 6-6.50 per cent $22.75; 6.51-7—$23.25; 7-7.50—$23.75; 7.51-8—$24.25; 8-8.50—$24.75; 8.51-9—$25.25; 9-9.50—$25.75; Buffalo $1.25 higher.

Bessemer Ferrosilicon†

Jackson county, O., base: Prices are the same as for silveries, plus $1 a ton.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon, 2 to 3%, $1 per ton add. Each unit over 3%, add $1 per ton.

Refractories

Per 1000 f.o.b. Works

Fire Clay Brick

Super Quality

Pa., Mo., Ky. $55.00

First Quality

Pa., Ill., Md., Mo., Ky. $45.00

Alabama, Georgia $38.00-45.00

Second Quality

Pa., Ill., Ky., Md., Mo. 40.00

Georgia, Alabama 35.00

Ohio

First quality $40.00

Intermediary 37.00

Second quality 28.00

Malleable Bung Brick

All bases 50.00

Silica Brick

Pennsylvania $45.00

Joliet, E. Chicago 54.00

Birmingham, Ala. 48.00

Ladle Brick (Dry Press)

Pa., O., W. Va., Mo. $24.00

Do., wire cut 22.00

Magnesite

Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) $45.00

Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) 40.00

Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) 22.00

Base Brick

Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick $45.00

Chem. bonded chrome 45.00

Magnesite brick 65.00

Chem. bonded magnesite 55.00

Fluorspar, 85-5

Washed gravel, duty paid, tide, net ton $21.50

Washed gravel, f.o.b. Ill., Ky., net ton, carloads, all rail $18.00

Do., for barge $19.00

Nonferrous

METAL PRICES OF THE WEEK

Spot unless otherwise specified. Cents per pound

	Copper: Electro, del. Conn.	Copper: Lake, del. Midwest	Copper: Casting, refinery	Straits Tin: New York Spot	Straits Tin: New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 99%	Antimony Chinese Spot, N. Y.	Nickel Cathodes
Sept. 26	9.75	9.87½	9.40	45.00	44.75	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 28	9.75	9.87½	9.40	45.25	44.90	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 29	9.75	9.87½	9.40	45.40	44.90	4.60	4.45	4.85	*19.00	12.50	35.00
Sept. 30	9.75	9.87½	9.40	46.00	45.55	4.60	4.45	4.85	*19.00	12.50	35.00
Oct. 1	9.75	9.87½	9.40	45.62½	45.12½	4.60	4.45	4.85	*19.00	12.50	35.00
Oct. 2	9.75	9.87½	9.40	45.45	44.90	4.60	4.45	4.85	*19.00	12.50	35.00

*Nominal range 19.00 to 21.00c.

MILL PRODUCTS

F.o.b. mill base, cents per lb. except as specified. Copper brass products based on 9.75c Conn. copper

Sheets

Yellow brass (high)	15.62½
Copper, hot rolled	17.50
Lead cut to jobbers	8.25
Zinc, 100-lb. base	9.50

Tubes

High yellow brass	17.87½
Seamless copper	18.00

Rods

High yellow brass	13.62½
Copper, hot rolled	14.25

Anodes

Copper, untrimmed	15.00

Wire

Yellow brass (high)	15.87½

OLD METALS

Deal. buying prices, cents lb.

No. 1 Composition Red Brass

New York	6.25- 6.50
*Cleveland	6.50-6.75
Chicago	6.12½-6.37½
St. Louis	6.00- 6.50

Heavy Copper and Wire

New York, No. 1	7.87½-8.00
*Chicago, No. 1	7.75- 8.00
Cleveland, No. 1	7.50- 8.00
St. Louis, No. 1	7.50- 7.75

Composition Brass Borings

New York	6.00- 6.12½

Light Copper

New York	6.62½- 6.75
*Chicago	6.25- 6.50
*Cleveland	6.25- 6.50
St. Louis	6.00- 6.50

Light Brass

*Chicago	3.75- 4.00
*Cleveland	3.50- 3.75
St. Louis	3.50- 4.00

Lead

New York	3.75- 4.00
*Cleveland	3.75- 3.85
*Chicago	3.62½-3.87½
St. Louis	3.25- 3.75

Zinc

New York	2.50- 2.75
St. Louis	2.25- 2.75
Cleveland	2.25- 2.50

Aluminum

Borings, Cleveland	9.50-10.00
Mixed, cast, Cleve.	13.00-13.37½
Mixed, cast, St. L.	13.00-13.50
Clips, soft, Cleve.	14.50-15.00

SECONDARY METALS

Brass ingot, 85-5-5-5	9.75
Stand. No. 12 alum.	16.75-17.25

Ferroalloys

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	75.00
Do., Baltimore, base	75.00
Do., del. Pittsburgh	80.13
Spiegeleisen, 19-20% dom. Palmerston, Pa., spot†	26.00
Do., New Orleans	26.00
Ferrosilicon, 50% freight allowed, c. l.	69.50
Do., less carload	77.00
Do., 75 per cent	126-130.00
Spot, $5 a ton higher.	
Silicoman., 2½ carbon	85.00
2% carbon, 90.00; 1%,	100.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del.	10.00
Ferrotungsten, stand., lb. con. del.	1.30-1.40
Ferrovanadium, 35 to 40% lb., cont.	2.70-2.90
Ferrotitanium, c. l., prod. plant, frt. all., net ton	137.50
Spot, 1 ton, frt. allow., lb.	7.00
Do., under 1 ton	7.50
Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $3 unitage	58.50
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $3 unitage	75.00
Ferromolybdenum, stand. 55-65%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads. Quan. diff. apply.

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated; † indicates brokers prices

HEAVY MELTING STEEL

Birmingham†	11.00-12.50
Bos. d'ck, No. 1, exp.	†12.25-12.50
N. Eng. del. No. 1	13.25
Buffalo, No. 1	15.00-16.00
Buffalo, No. 2	14.00-14.50
Chicago, No. 1	16.00-16.50
Cleveland, No. 1	15.50-16.00
Cleveland, No. 2	15.00-15.50
Detroit, No. 1	14.50-15.00
Eastern Pa., No. 1	15.50-16.00
Eastern Pa., No. 2	14.00-14.50
Federal, Ill.	12.75-13.25
Granite City, R. R.	14.25-14.75
Granite City, No. 2	12.75-13.25
New York, No. 2	†10.50-11.00
N. Y. d'ck, No. 1, exp.	†12.25
Pitts., No. 1 (R. R.)	19.00-19.50
Pitts., No. 1 (dlr.)	18.00-18.50
Pittsburgh, No. 2	16.00-16.50
St. Louis, R. R.	14.25-14.75
St. Louis, No. 2	12.50-13.00
Toronto, dealers	7.50
Valleys, No. 1	16.75-17.25

COMPRESSED SHEETS

Buffalo dealers	14.00-14.50
Chicago, factory	15.00-15.50
Chicago, dealer	14.00-14.25
Cleveland	15.00-15.50
Detroit	14.50-15.00
E. Pa., new mat.	15.00-15.50
E. Pa., old mat.	12.50-13.00
Pittsburgh	18.25-18.75
St. Louis	11.50-12.00
Valleys	16.50-16.75

BUNDLED SHEETS

Buffalo	12.00-12.50
Cincinnati, del.	9.50-10.00
Cleveland	12.50-13.00
Pittsburgh	16.00-16.50
St. Louis	10.00-10.50
Toronto, dealers	4.50

SHEET CLIPPINGS, LOOSE

Chicago	10.00-10.50
Cincinnati	8.50- 9.00
Detroit	11.00-11.50
St. Louis	8.00- 8.50

STEEL RAILS, SHORT

Birmingham	13.00-15.00
Buffalo	16.50-17.50
Chicago (3 ft.)	17.25-17.75
Chicago (2 ft.)	18.25-18.75
Cincinnati, del.	16.50-17.00
Detroit	16.50-17.00
Pitts., open-hearth, 3 ft. and less	20.00-20.50
St. Louis, 2 ft. & less	16.00-16.50

STEEL RAILS, SCRAP

Boston district	†11.50-11.75
Buffalo	15.00-16.00
Chicago	16.00-16.50
Pittsburgh	18.50-19.00
St. Louis	15.00-15.50
Toronto, dealers	8.50

STOVE PLATE

Birmingham	8.00- 9.00
Boston, district	†7.00- 7.75
Buffalo	10.00-11.00
Chicago	9.00- 9.50
Cincinnati, dealers	9.50-10.00
Detroit, net	9.00- 9.50
Eastern Pa.	12.50-13.00
New York, fdry	†8.75- 9.25
St. Louis	8.50- 9.00
Toronto, dealers, net	5.50

COUPLERS, SPRINGS

Buffalo	16.00-17.00
Chicago, springs	18.25-18.75
Eastern Pa.	19.00-19.50
Pittsburgh	20.50-21.00
St. Louis	15.50-16.00

ANGLE BARS—STEEL

Chicago	17.50-18.00
St. Louis	15.50-16.00
Buffalo	14.50-15.00

RAILROAD SPECIALTIES

Chicago	18.00-18.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.50-17.50
Cleveland, billet, bloom crops	19.00-19.50
Eastern Pa., crops	17.50-18.00
Pittsburgh, billet, bloom crops	20.50-21.00
Pittsburgh, sheet bar crops	19.50-20.00

FROGS, SWITCHES

Chicago	16.00-16.50
St. Louis, cut	15.00-15.50

SHOVELING STEEL

Chicago	16.00-16.50
Federal, Ill.	13.00-13.50
Granite City, Ill.	12.75-13.25
Toronto, dealers	6.50

RAILROAD WROUGHT

Birmingham	8.00- 9.00
Boston, district	†8.00- 8.25
Buffalo, No. 1	14.00-14.50
Buffalo, No. 2	15.00-16.00
Chicago, No. 1, net	14.00-14.50
Chicago, No. 2	16.00-16.50
Cincinnati, No. 2	14.00-14.50
Eastern Pa.	16.00
St. Louis, No. 1	13.00-13.50
St. Louis, No. 2	14.50-15.00
Toronto, No. 1 dlr.	7.00

SPECIFICATION PIPE

Eastern Pa.	14.00-14.50
New York	†10.00-10.50

BUSHELING

Buffalo, No. 1	14.00-14.50
Chicago, No. 1	14.75-15.25
Cincin., No. 1, deal.	11.00-11.50
Cincinnati, No. 2	6.50- 7.00
Cleveland, No. 2	10.50-11.00
Detroit, No. 1, new	14.00-14.50
Valleys, new, No. 1	16.50-16.75
Toronto, dealers	6.00

MACHINE TURNINGS

Birmingham	6.00- 6.50
Buffalo	8.00- 8.50
Chicago	8.50- 9.00
Cincinnati, dealers	7.50- 8.00
Cleveland	10.00-10.50
Detroit	9.00- 9.50
Eastern Pa.	9.50-10.00
New York	†6.75- 7.00
Pittsburgh	12.75-13.25
St. Louis	6.00- 6.50
Toronto, dealers	4.00
Valleys	10.75-11.25

BORINGS AND TURNINGS

For Blast Furnace Use

Boston district	†5.25- 5.50
Buffalo	9.25- 9.75
Cincinnati, dealers	6.50- 7.00
Cleveland	10.50-11.00
Detroit	9.00- 9.50
Eastern Pa.	7.50- 8.00
New York	†4.75- 5.00
Pittsburgh	12.00-12.50
Toronto, dealers	4.00

CAST IRON BORINGS

Birmingham	6.00- 6.50
Boston dist. chem.	†6.25- 6.75
Boston dist. for mills	†6.00- 6.25
Buffalo	9.25- 9.75
Chicago, dealers	9.25- 9.75
Cincinnati, dealers	6.50- 7.00
Cleveland	10.50-11.00
Detroit	9.00- 9.50
E. Pa., chemical	10.00-13.00
New York	†6.00- 6.50
St. Louis	5.50- 6.00
Toronto, dealers	5.00

PIPE AND FLUES

Cincinnati, dealers	9.00- 9.50
Chicago, net	8.00- 8.50

RAILROAD GRATE BARS

Buffalo	11.00-11.50
Chicago, net	10.00-10.50
Cincinnati	9.00- 9.50
Eastern Pa.	12.50
New York	†8.00- 8.50
St. Louis	10.50-11.00

FORGE FLASHINGS

Boston district	†9.75-10.00
Buffalo	14.00-14.50
Cleveland	14.50-15.00
Detroit	13.00-13.50
Pittsburgh	16.00-16.50

FORGE SCRAP

Boston district	†6.50- 7.00
Chicago, heavy	18.00-18.50
Eastern Pa.	15.00-15.50

ARCH BARS, TRANSOMS

St. Louis	16.50-17.00

AXLE TURNINGS

Boston district	†7.25- 7.50
Buffalo	12.00-12.50
Chicago, elec. fur.	15.50-16.00
Eastern Pa.	13.00-14.00
St. Louis	10.50-11.00
Toronto	4.50

STEEL CAR AXLES

Birmingham	13.00-14.00
Boston district	†14.50-15.00
Buffalo	16.50-17.50
Chicago, net	18.00-18.50
Eastern Pa.	21.50
St. Louis	16.50-17.00
Toronto	8.50

SHAFTING

Boston district	†15.25-15.75
Eastern Pa.	21.00-21.50
New York	†16.50-17.00
St. Louis	15.00-15.50

CAR WHEELS

Birmingham	12.50-13.50
Boston dist. iron	†11.00-11.50
Buffalo, iron	15.00-15.50
Buffalo, steel	16.50-17.50
Chicago, iron	16.00-16.50
Chicago, rolled steel	18.00-18.50
Cincinnati, iron	13.00-13.50
Eastern Pa., iron	17.00
Eastern Pa., steel	19.00-19.50
Pittsburgh, iron	18.00-18.50
Pittsburgh, steel	20.50-21.00
St. Louis, iron	14.00-14.50
St. Louis, steel	16.00-16.50
Toronto, net	8.50

NO. 1 CAST SCRAP

Birmingham	11.50-12.50
Bos. dis. No. 1 mch.	†10.75-11.00
N. Eng., del. No. 2.	†9.00- 9.25
N. Eng., del. textile	12.00-12.50
Buffalo, cupola	13.50-14.00
Buffalo, mach.	15.00-15.50
Chicago, agri. net	12.00-12.50
Chicago, auto	12.50-13.00
Chicago, mach. net	13.50-14.00
Chicago, railr'd net	12.50-13.00
Cinci., mach. cup.	13.50-14.00
Cleveland, mach.	16.25-16.75
Eastern Pa., cupola	16.50-17.00
E. Pa., mixed yard	14.50
Pittsburgh, cupola	17.00-17.50
San Francisco, del.	13.50-14.00
Seattle	10.00-11.00
St. Louis, No. 1	12.50-13.00
St. L. No. 1, mach.	13.00-13.50
Toronto, No. 1, mach., net	9.00

HEAVY CAST

Boston dist. break.	10.25-10.50
New England del.	11.00-11.50
Buffalo, break.	12.50-13.00
Cleveland, break.	13.00-13.50
Detroit, No. 1 mach. net	13.50-14.00
Detroit, break.	11.50-12.00
Detroit, auto net	13.50-14.00
Eastern Pa.	15.50-16.00
New York breakable	†11.25-11.75
Pittsburgh	15.00-15.50

MALLEABLE

Birmingham, R. R.	12.00-13.00
New England, del.	†16.25-17.50
Buffalo	15.50-16.50
Chicago, R. R.	18.00-18.50
Cinci., agri. del.	14.00-14.50
Cleveland, rail	17.50-18.00
Detroit, auto, net	14.50-15.00
Eastern Pa., R. R.	17.50
Pittsburgh, rail	17.50-18.00
St. Louis, R. R.	15.50-16.00
Toronto, net	7.00

RAILS FOR ROLLING

5 feet and over

Birmingham	13.00-14.00
Birmingham	†11.00-11.50
Buffalo	15.50-16.50
Chicago	16.50-17.00
Eastern Pa.	16.00
New York	†12.00-12.50
St. Louis	16.00-16.50

LOCOMOTIVE TIRES

Chicago (cut)	17.50-18.00
St. Louis, No. 1	13.50-14.00

LOW PHOS. PUNCHINGS

Buffalo	16.50-17.50
Chicago	18.00-18.50
Eastern Pa.	18.00-18.50
Pittsburgh (heavy)	19.50-20.00
Pittsburgh (light)	18.50-19.00

Iron Ore

Lake Superior Ore

Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56-63% con. (nom.)	8.50- 9.00
Con.-free low phos. 58-60% (nom.)	10.00-10.50

Foreign Ore

Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	11.00
No. Afr. low phos.	11.00
Swedish basic, 65%	9.50
Swedish low phos.	10.50
Spanish No. Africa basic, 50 to 60%	nom.
Tungsten, spot sh. ton unit, duty pd.	$15.85-16.00
N. F., fdy., 55%	7.00
Chrome ore, 48% gross ton, c.i.f.	19.50-19.75

Manganese Ore

(Nominal)

Prices not including duty, cents per unit cargo lots.

Caucasian, 50-52%	27.00
So. African, 50-52%	27.00
Indian, 50-52%	26.00

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS

Baltimore*	3.10c
Boston††	3.30c
Buffalo	3.10c
Chattanooga	3.56c
Chicago (j)	3.20c
Cincinnati	3.42c
Cleveland	3.10c
Detroit	3.29c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.31c-3.46c
New Orleans	3.55c
New York‡ (d)	3.51c
Pitts. (h)	3.15c-3.30c
Philadelphia*	3.25c
Portland	3.60c
San Francisco	3.25c
Seattle	3.80c
St. Louis	3.35c
St. Paul	3.45c-3.60c
Tulsa	3.35c

IRON BARS

Portland	3.50c
Chattanooga	3.56c
Baltimore*	3.10c
Chicago	2.85c
Cincinnati	3.42c
New York‡ (d)	3.15c
Philadelphia*	3.25c
St. Louis	3.35c
Tulsa	3.35c

REINFORCING BARS

Buffalo	2.60c
Chattanooga	3.56c
Chicago	2.10c-2.60c
Cleveland (c)	2.10c
Cincinnati	3.25c
Houston	3.25c
Los Angl., cl.	2.45c
New Orleans	3.50c
Pitts., plain (h)	3.05c
Pitts., twisted squares (h)	3.175c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.35c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES

Baltimore*	3.10c
Boston††	3.29c
Buffalo	3.35c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland	3.41c
Detroit	3.52c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York‡ (d)	3.47c
Philadelphia*	3.10c
Pittsburgh (h)	3.25c
Portland (l)	3.60c
San Francisco	3.25c
Seattle (i)	3.65c
St. Louis	3.45c
St. Paul	3.55c
Tulsa	3.60c

PLATES

Baltimore*	3.10c
Boston††	3.31c
Buffalo	3.47c
Chattanooga	3.66c
Chicago	3.30c
Cincinnati	3.52c
Cleveland, ¼-in. and over	3.41c
Detroit	3.52c
Detroit, ⅜-in.	3.85c
Houston	3.10c
Los Angeles	3.60c
Milwaukee	3.41c
New Orleans	3.65c
New York‡ (d)	3.50c
Philadelphia*	3.10c
Phila. floor	4.95c
Pittsburgh (h)	3.25c
Portland	3.60c
San Francisco	3.25c
Seattle	3.65c
St. Louis	3.55c
St. Paul	3.55c
Tulsa	3.60c

NO. 10 BLUE

Baltimore*	3.10c
Boston (g)	3.40c
Buffalo	3.72c
Chattanooga	3.46c
Chicago	3.15c
Cincinnati	3.32c
Cleveland	3.21c
Det. 8-10 ga.	3.24c
Houston	3.45c
Los Angeles	3.70c
Milwaukee	3.26c
New Orleans	3.65c
New York‡ (d)	3.41c
Portland	3.85c
Philadelphia*	3.20c
Pittsburgh (h)	3.05c
San Francisco	3.60c
Seattle	3.85c
St. Louis	3.40c
St. Paul	3.40c
Tulsa	3.80c

NO. 24 BLACK

Baltimore*†	3.70c
Boston (g)	4.05c
Buffalo	3.35c
Chattanooga*	3.51c
Chicago	3.55c-4.55c
Cincinnati	4.22c
Cleveland	4.01c
Detroit	4.14c
Los Angeles	4.35c
Milwaukee	4.16c
New Orleans	4.50c
New York‡ (d)	4.10c
Phila.*†	3.85c
Pitts.** (h)	3.65c-4.95c
Portland	4.20c
San Francisco	4.20c
Seattle	4.50c
St. Louis	4.20c
St. Paul	4.10c
Tulsa	4.85c

NO. 24 GALV. SHEETS

Baltimore*†	3.90c
Buffalo	4.10c
Boston (g)	4.00c
Chattanooga*	3.96c
Chicago (h)	4.15c-5.15c
Cincinnati	4.82c
Cleveland	4.61c
Detroit	4.82c
Houston	4.50c
Los Angeles	4.40c
Milwaukee	4.76c
New Orleans	4.95c
New York‡ (d)	4.50c
Philadelphia*†	4.50c
Pitts.** (h)	4.30c-5.55c
Portland	4.60c
San Francisco	5.00c
Seattle	5.10c
St. Louis	4.90c
St. Paul	4.60c
Tulsa	5.20c

BANDS

Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.52c
Chattanooga	3.71c
Chicago	3.40c
Cincinnati	3.57c
Cleveland	3.46c
Detroit, ⅜-in. and lighter	3.49c
Houston	3.35c
Los Angeles	4.20c
Milwaukee	3.51c
New Orleans	4.05c
New York‡ (d)	3.66c
Philadelphia*	3.30c
Pittsburgh (h)	3.30c
Portland	4.35c
San Francisco	4.20c
Seattle	4.35c
St. Louis	3.65c
St. Paul	3.65c
Tulsa	3.55c

HOOPS

Baltimore	2.30c
Boston††	4.40c
Buffalo	3.52c
Chicago	3.40c
Cincinnati	3.57c
Det., No. 14 and lighter	3.49c
Los Angeles	5.95c
Milwaukee	3.51c
New York‡ (d)	3.66c
Philadelphia*	3.55c
Pittsburgh (h)	3.80c
Portland	5.70c
San Francisco	6.25c
Seattle	5.70c
St. Louis	3.65c
St. Paul	3.65c

COLD FIN. STEEL

Baltimore (c)	3.88c
Boston*	4.15c
Buffalo (h)	3.70c
Chattanooga*	4.38c
Chicago (h)	3.75c
Cincinnati	3.97c
Cleveland (h)	3.75c
Detroit	3.84c
Los Ang. (f) (d)	5.85c
Milwaukee	3.86c
New Orleans	4.55c
New York‡ (d)	3.96c
Philadelphia*	4.01c
Pittsburgh	3.60c
Portland (f) (d)	6.30c
San Fran.(f) (d)	5.95c
Seattle (f) (d)	6.25c
St. Louis	3.90c
St. Paul	4.27c
Tulsa	4.80c

COLD ROLLED STRIP

Boston	3.245c
Buffalo	3.39c
Chicago	3.27c
Cincinnati (b)	3.22c
Cleveland (b)	3.00c
Detroit	3.18c
New York‡ (d)	3.36c
St. Louis	3.41c

TOOL STEELS

(Applying on or east of Mississippi river; west of Mississippi 1c up)

	Base
High Speed	59½c
High carbon, high chrome	39c
Oil hardening	23c
Special tool	21c
Extra tool	17¾c
Regular tool	14½c

Uniform extras apply.

BOLTS AND NUTS

(100 pounds or over)

	Discount
Chicago (a)	65
Cleveland	70
Detroit	70
Milwaukee	70
Pittsburgh	65-5

(a) Under 100 lbs., 60 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Quantity base; (e) New mill classif. (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less; (i) Under 3 in.; (j) Shapes other than rounds, flats, fillet angles, 3.35c.

Prices on heavier lines are subject to new quantity differentials: 399 lbs. and less, up 50 cts.; 400 to 3999 lbs., base; 4000 to 7999 lbs., 15 cts., under; 8000 to 14,999 lbs., 25 cts. under; 15,000 to 39,999 lbs., 35 cts. under; 40,000 lbs. and over, 50 cts. under; (except Boston).

‡Domestic steel; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Oct. 1

Export Prices f. o. b. Ship at Port of Dispatch—(By Cable or Radio)

	British gross tons U. K. ports £ s d	Continental Channel or North Sea ports, metric tons Quoted in dollars at current value	**Quoted in gold pounds sterling £ s d
PIG IRON			
Foundry, 2.50-3.00 Silicon	$15.44 3 2 6*	$14.14	1 15 0
Basic bessemer	15.44 3 2 6*	11.72	1 9 0
Hematite, Phos. .03-.05	18.53 3 15 0	.....	.....
SEMIFINISHED STEEL			
Billets	$29.02 5 17 6	$18.99	2 7 0
Wire rods, No. 5 gage	44.21 8 19 0	36.37	4 10 0
FINISHED STEEL			
Standard rails	$40.76 8 5 0	$44.47	5 10 0
Merchant bars	1.88c 8 10 0	1.20c	3 5 0
Structural shapes	1.82c 8 5 0	1.13c	3 1 6
Plates, †¼ in. or 5 mm.	1.91c 8 12 6	1.56c	4 5 0
Sheets, black, 24 gage or 0.5 mm	2.21c 10 0 0	2.37c	6 10 0††
Sheets, gal., 24 gage, corr.	2.60c 11 15 0	2.56c	7 0 0
Bands and strips	2.04c 9 5 0	1.46c	4 0 0
Plain wire, base	2.15c 9 15 0	1.93c	5 5 0
Galvanized wire, base	2.54c 11 10 0	2.14c	5 17 6
Wire nails, base	2.65c 12 0 0	1.74c	4 15 0
Tin plate, box 108 lbs.	$ 4.63 0 18 9	.....	.....

British ferromanganese £75 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

		£ s d		French Francs		Belgian Francs		Reich Marks
Fdy. pig iron, Si. 2.5	$18.53	3 15 0(a)	$14.21	290	$15.21	450	$25.20 (b)	63
Basic bessemer pig iron	18.53	3 15 0(a)	9.31	190	13.01	385	27.80 (b)	69.50
Furnace coke	5.31	1 1 6	5.10	104	4.63	137	7.60	19
Billets	30.26	6 2 6	22.39	457	19.60	580	38.60	96.50
Standard rails	1.82c	8 5 0	1.48c	671	1.73c	1,150	2.38c	132
Merchant bars	2.06c	9 7 0	1.39c	630	1.05c	700	1.98c	110
Structural shapes	2.07c	9 7 6	1.36c	620	1.05c	700	1.93c	107
Plates, †¼-in. or 5 mm.	2.14c	9 13 9	1.74c	790	1.28c	850	2.29c	127
Sheets, black	2.65c	12 0 0§	1.76c	800‡	1.39c	925‡	2.59c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm	3.09c	14 0 0	2.86c	1,300	2.25c	1,500	6.66c	370
Plain wire	2.15c	9 15 0	2.42c	1,100	1.88c	1,250	3.11c	173
Bands and strips	2.23c	10 2 0	1.62c	735	1.28c	850	2.29c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continent usually for basic-bessemer steel. a del. Middlesbrough. b hematite. ††Close annealed.

**Gold pound sterling carries a premium of 65.88 per cent over paper sterling.

Bars

Bar Prices, Page 68

Pittsburgh—Most bar users were able to place specifications at the old third-quarter price right up through Sept. 30, but owing to the heavy backlogs which bar mills have were unable to obtain much better than a "at mill's convenience" promise on delivery. Since Oct. 1 the advanced market of 2.05c, f.o.b. Pittsburgh, for merchant bars has become nominally quoted but as yet has not undergone any significant test. The same condition characterizes rail steel bars, which were also advanced $2 a ton.

Cleveland — The price advance drove in considerable tonnage from miscellaneous consumers. Individual orders between 500 and 1500 tons were not uncommon. Most of them are to be shipped sometime in October, at mill's convenience.

Chicago—Producers have heavy backlogs of steel bars, and shipments during the new quarter will be larger than those during the third period. Automotive releases continue to increase, while farm implement manufacturers are taking slightly larger tonnages. Demand from cold-bar finishers is good. Forging bars are moving well, partly reflecting increased automotive activity. The market now is 2.10c, base, for soft steel bars, 1.95c for rail steel and 1.95c, Terre Haute, Ind., and 2.00c, Chicago, for bar iron.

Boston—The usual rush to close on bars at old prices has failed to materialize in this district. However, considerable covering was done earlier in the month.

New York—While there has been a letdown in bars due to the extra covering prior to the $2 price advance on soft and cold drawn steel, inquiry is still active. Shipments for weeks past have been so extended that consumers have been having difficulty providing for current requirements and this condition still prevails.

Philadelphia — Following heavy buying over the closing days of last month, prior to the $2 increase in prices on soft and cold-drawn descriptions, bar business has slumped off. However there is still a good tonnage available, with deliveries the deciding factor.

Youngstown, O. — Specifications on practically all forms of steel bars continue to pour into sales offices in this district and mills are falling somewhat behind in delivery dates.

Spicer Mfg. Co., Toledo, O., has declared a quarterly dividend of 75 cents on the preferred "A" stock, no par, and dividend of $1 on common stock, no par, both payable Oct. 15 to stock of record Oct. 5.

Plates

Plate Prices, Page 68

New York—Plate deliveries are improving and prices are firm. The Savannah line contemplates the construction of two passenger boats requiring about 10,000 tons of hull steel in the next six to eight months.

Pittsburgh — Nashville Bridge Co., Nashville, Tenn., has been awarded two oil barges for use on the Ohio river by the Gulf Oil Corp. An inquiry for 800 tons of plates in pontoons and pipe for the Nashville, Tenn., engineers' office is being currently circulated.

Cleveland — Demand for light gages out of stock has shown improvement. Some mills are booked ahead four to six weeks, but others have been able to arrange comparatively prompt delivery. While there has been an increase of $1 on export plates, prices remain firm.

Chicago — New plate orders are

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fairly numerous, but individual purchases continue small. Railroads and freight car builders are accounting for the largest volume and this movement is expected to continue active. Some railroad shops have increased operations.

Boston—Awards announced last week totaled 640 tons, and bids were taken at Rockland, Mass., for 425 tons for an elevated steel tank. Deliveries are still forward three to four weeks.

Philadelphia—Plate tonnage continues spotty, with volume substantially down from two or three weeks ago and mill deliveries showing improvement. Most producers are now able to offer deliveries within a week to 10 days. Approximately 390 tons are required for a mine planting boat, with bids opening around Oct. 15.

Seattle—Demand for plates has improved. Pending business includes 300 tons for a 36-inch steel pipe for Spokane, Wash.

Salem, Oreg., has called bids Oct. 13 for 16 miles of 27 to 36-inch water pipe, involving 4500 tons. PWA has alloted Everett, Wash., $585,000 for a proposed water extension project involving 6000 tons of 36 to 52-inch pipe.

San Francisco—The largest plate award went to Consolidated Steel Corp. and involved 150 tons for tunnel ribs for the metropolitan water district, Los Angeles. Los Angeles has just taken bids on 500 tons of 24-in. welded steel pipe. To date 104,515 tons have been booked, against only 37,875 tons for the corresponding period in 1935.

Contracts Pending

4500 tons, 27 to 36-inch pipe, water system extension, Salem, Oreg.; bids Oct. 13.
800 tons, pontoons and pipe for Memphis, Tenn., army engineers.
780 tons, two oil barges for Gulf Oil Corp., to Nashville Bridge Co., Nashville, Tenn.
425 tons, 1,000,000-gallon elevated steel tank, Rockland, Mass.; bids taken Sept. 29 at Rockland.
300 tons, Spokane, Wash., pumping house project; Clifton & Applegate, Spokane, general contractors.
240 tons, digester tank for unidentified paper mill in Portland, Me., to Lukens Steel Co., Coatesville, Pa.
200 tons, fishing trawler, Booth Fisheries Inc., Boston, to Lukens Steel Co., Coatesville, Pa., through Bath Iron Works, Bath, Me.
200 tons, fishing trawler, Trawler Arlington Inc., Boston, to Lukens Steel Co., Coatesville, Pa., through Bath Iron Works, Bath, Me.
150 tons, tunnel ribs, metropolitan water district, Los Angeles, bid 68166 to Consolidated Steel Corp., Los Angeles.
Unstated tonnage, 400,000-gallon elevated steel tank, Beaver Dam, Wis.; bids Oct. 5.
Unstated tonnage, two lighters for Puget Sound navy yard, Washington.
Unstated tonnage, storage tank and terminals, The Dalles, Oreg.; for Inland Navigation Co.

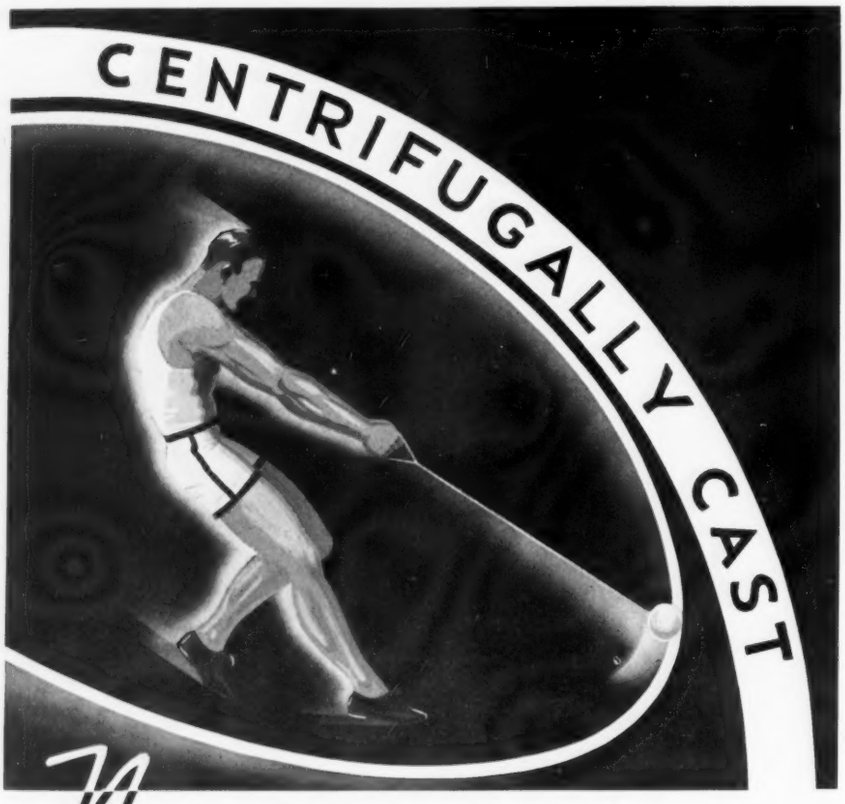
Sheets

Sheet Prices, Page 68

Pittsburgh—Since early last week sheet buying has shown a declining tendency, although the present market finds mills with their heaviest backlogs at any time in the last seven years, having accepted more business during September than in any month since 1929. The higher market of 2.60c, f.o.b. Pittsburgh, for No. 24 hot-rolled annealed sheets has not been adequately tested yet.

Cleveland — Extensive backlogs and the probability of still heavier demands for the fourth quarter have led some mills to have their larger customers estimate further ahead than customarily. Miscellaneous consumers have been buying heavily, but they have had little opportunity to stock, even if they were so inclined. Shipments during September exceeded August, and no let up is expected through the fourth quarter.

Chicago—Deliveries have become



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an increasingly serious problem for sheet mills here as a result of recent backlog additions. Near-capacity schedules appear likely during fourth quarter, particularly in hot-rolled annealed sheets. Hot-rolled annealed sheets now are quoted 2.70c, Gary, with prices of other grades continuing at third quarter levels.

New York—Sheet business is brisk and sellers report little or no falling off in volume since the Oct. 1 price advances.

Philadelphia—While there is a lull, sheet business is still good, with pressure for deliveries apparently as strong as ever. New prices and extras, announced last month, are now generally effective.

Youngstown, O. — Practically every concern which normally uses sheets is coming forward with mill orders all at this turn of the quarter. Both black and galvanized sheets are foremost in the minds of buyers, according to the tonnages placed.

Cincinnati—Buying from district sheet mills continues above rated capacity, adding further to backlogs and further extending deliveries on some grades.

St. Louis — Sheet demand continues active. Purchasing of No. 24 gage hot-rolled annealed was heavy near the end of September. Demand for enameling stock is brisk. Effective Oct. 1 the leading local producer quotes No. 24 hot-rolled annealed sheets at 2.935c per 100 lbs. delivered in St. Louis and subject to standard differentials and extras in effect at time of shipment.

Pipe

Pipe Prices, Page 69

Pittsburgh—Godfrey Cabot Gas Corp., Boston, last week placed an order for about 92 miles of 14-inch o.d. line pipe amounting to about 9000 tons with the A. O. Smith Corp., Milwaukee. At many points existing lines are being repaired lending some activity, such as the Stanolind Co.'s lap weld line in Wyoming, and various lines for Magnolia Petroleum Corp. In general, specifications show a slight decline.

Cleveland — September requirements for the general run of pipe and fittings for industrial expansion and repair work show marked improvement over August. Further improvement is expected in the near future. Jobbers' stocks have shown an encouraging rate of turnover.

Chicago — Cast pipe producers have sufficient backlogs and business in prospect to support fairly heavy shipments during the next 30 days. Madison, Wis., has taken bids on 300 tons. Prices are steady.

Boston—The cast pipe market continues active and prices, which were being shaded about a month ago, are now firm at the base prices. Bids were taken Sept. 30 on 450 tons of 12 and 16 inch for the water department at Danbury, Conn.

Youngstown, O. — Although oil country goods and line pipe needs are taking most of the tonnage shipments, building construction has also been taking a large share of both butt and lap-welded pipe. Shipments in September were slightly less than in August, and October promises to be the best in many months.

New York—An inquiry for 350 tons of miscellaneous pipe for the Public Service Corp. is the feature of an otherwise dull market for sizable tonnages.

Seattle—Cast pipe producers are marking time with no important projects pending. Demand for steel and galvanized pipe, small gages,

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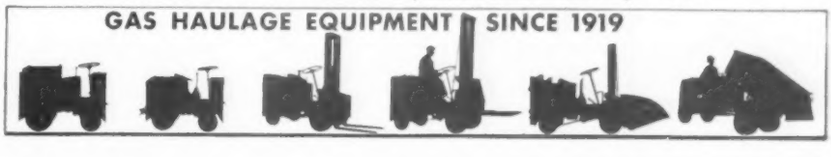


has improved. Pacific States Cast Iron Pipe, Co., Provo, Utah, is low at $35,550 for a water system in Yellowstone county, Montana. Genesee, Idaho, has opened bids for a $25,000 water system, including pipe. Willapa Valley water district, Raymond, Wash., plans a $71,000 system, with state and federal aid.

Cast Pipe Placed

400 tons, two unidentified orders, to Warren Pipe Co. of Massachusetts, Everett, Mass.

Unstated tonnage, 2000 feet 8-inch for water treatment plant, Neenah, Wis., to James B. Clow & Son, Chicago.

Steel Pipe Placed

9000 tons, 92 miles of 14-inch o. d. line pipe, from a Pennsylvania point to Rochester, N. Y., for Godfrey Cabot Gas Corp., Boston, to A. O. Smith Corp., Milwaukee.

Cast Pipe Pending

552 tons, 4 to 10-inch, Walnut Creek, Calif.; bids Oct. 7.

450 tons, 12,000 feet of 12 and 16-inch, Danbury, Conn., water department; bids taken Sept. 30.

350 tons, 5800 feet 16-inch, and smaller sizes, Public Service Corp., Jersey City and Newark, N. J.

300 tons, 24-inch, Madison, Wis.

Unstated tonnage, fittings, Springfield avenue pumping station, Chicago; bids Oct. 13.

100 tons, 6 and 8-inch, Fall River, Mass.; United States Pipe & Foundry Co., low.

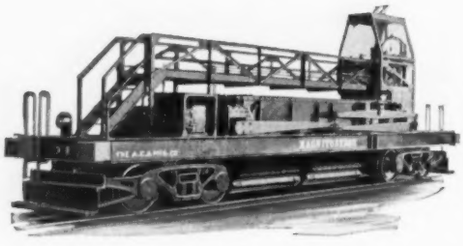
100 tons, 8 and 12-inch, alternate wood, for Blaine, Wash.; bids Oct. 5.

Unstated tonnage, 4000 to 5000 feet of 6-inch class 250; bids closed Oct. 1.

Steel Pipe Pending

500 tons, 4-inch steel pipe extension, each 6 feet 3 inches long, Chicago; bids Oct. 13.

ATLAS SCALE CARS



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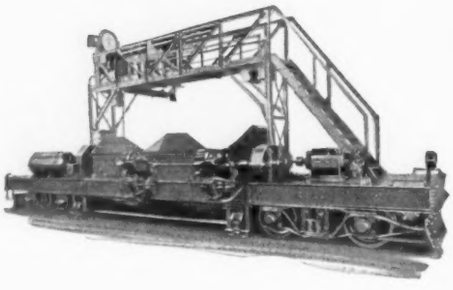

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Transportation

Track Material Prices, Page 69

Railroad purchases of equipment and track materials are still principally in the formative stage, but the possibility of a shortage in carrying equipment this fall and winter may stimulate commitments soon.

Various roads are reported planning rail purchases later this month. The current rail price of $36.37½ per gross ton will be effective until Nov. 1, and a revision thereafter is problematical. Unlike other finished steel products, however, the market on rails has not moved up in the past three years. Much activity is evident in repair shops, where many bad order cars are being put in shape.

New York, New Haven & Hartford is reported seeking court permission to spend $1,081,000 for equipping box cars with cast steel side frames to comply with the ruling of the Association of American Railroads.

Car Orders Placed

Chicago & Eastern Illinois railroad, 500 50-ton box cars, to General American Transportation Corp., New York.

Locomotives Placed

Birmingham Southern, five 900-horsepower, 125-ton diesel-electric locomotives, to Electro-Motive Corp., La Grange, Ill.

Rail Orders Pending

Missouri Pacific railroad, 2000 tons of 112-pound rails, authorized by federal court.

Car Orders Pending

Texas Co., New York, four 10,000-gallon tank cars for export; bids asked.

Cold Finished

Cold Finished Prices, Page 69

Pittsburgh—A heavy volume of buying late in September of cold-finished carbon steel bars has cared

for practically all consumers' needs over October. There has been little if any test on the advanced base prices. Many mills now have the largest backlogs for any given time in the last seven years.

Strip

Strip Prices, Page 69

Pittsburgh—Reductions in pickling and oiling extras on hot-rolled strip steel which were announced for effect with Oct. 1, amount to 15 cents on 13, 14, 15 and 16 gages for material 12⅛ to 23⅛ inches wide, bringing the extra down from 35 to 20 cents. On 12-gage and thicker in the same width of hot-rolled strip the reduction in pickling and oiling extras has been 10 cents. Most strip mills in this district have now accumulated the largest backlogs awaiting rolling since 1928 and 1929.

Cleveland—Auto partsmakers requirements have shown a marked increase the last two weeks, while electrical equipment manufacturers continue at an active pace. Most mills are operating at capacity. Backlogs now range from four to six weeks. Considerable forward buying has been noticed.

Chicago—Strip demand is holding well in most directions, with shipments bolstered by the better movement to the automotive industry. Third-quarter base prices of 2.05c, Chicago or Gary, for hot-rolled strip and 2.60c, Pittsburgh or Cleveland, for cold-rolled strip are being continued. Pickling and oiling extras on hot-rolled strip of larger widths have been reduced.

Boston—Strip sales are heavy, with customers desirous of immediate delivery. Delivery time has been pushed back three to four weeks.

Youngstown, O.—Users of both hot and cold-rolled strip continue to pile up specifications covering their needs with Valley mills, thus insuring satisfactory production for some weeks ahead.

Wire

Wire Prices, Page 69

Pittsburgh—Buying of both merchant and manufacturing wire products was hastened up until last week by the price advance. F.o.b. Pittsburgh nails are now $2.05 per keg; polished staples, $2.75; galvanized fence staples, $3; galvanized barbed wire, 2.55c; annealed fence wire, 2.80c; galvanized fence wire, 3.15c, and woven wire fencing, $60 per base column. Plain wire has been advanced to 2.50c, 6 to 9 gage base, f.o.b. Pittsburgh, and spring wire to 3.15c.

Cleveland—Demand for wire nails declined slightly during September. Manufacturing wire, however, has enjoyed a very active month; one of the best of the year. Little stocking has been noticed among miscellaneous consumers even though many expected a general price advance. Deliveries range from two to three weeks on some grades. Price adjustments for fourth quarter included an advance of $2 on wire rods, and $3 on nails and other merchant products including fence wire. A 5-cent increase in the spread between jobbers and retail prices has been also instituted.

Boston — Manufacturers wire is now quoted at 2.62½c at Worcester, Mass., base, and 2.72½c, Boston. Spring wire is being quoted at 3.17½c, Worcester base, and 3.27½c, Boston.

Chicago—Increases of $2 a ton on plain wire and wire rods and $3 a ton on wire products have been applied for fourth quarter. Nails are $2.10 per keg, Chicago base, or $2.13,

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delivered Chicago, with plain wire 2.55c, base, and wire rods $41 to $43, Chicago base. The spread between jobbers' quotations and retail prices of merchant products has been increased from 10 cents to 15 cents per 100 pounds.

Tin Plate

Tin Plate Prices, Page 68

Pittsburgh—A survey of tin plate producers' schedules last week indicates basis for an advance of seven to eight points as the producing average for the industry, making this figure now 97-98 per cent. Barring one hot mill which is on a slightly curtailed schedule, all of the country's capacity is working full, although shipments are reducing backlogs with the result that hot mills now have three to four weeks ahead of them and cold mills four to five weeks. Some mills state they will begin rolling 1937 plate within the next month, and it is expected the 1937 contract price will be announced to the trade around Nov. 15. The $5.25 market, f.o.b. Pittsburgh, for standard tin plate is unchanged.

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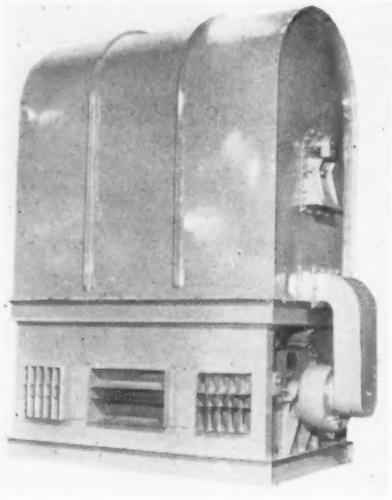

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Shapes

Structural Shape Prices, Page 68

Pittsburgh—Structural inquiries the past week include 1800 tons for transmission towers at Safe Harbor, Pa., for Pennsylvania Water Power Co. The state highway department, Harrisburg, Pa., wants bids by Oct. 16 on 1220 tons for a viaduct at Wilkes Barre, Pa. Bethlehem Steel Co. has taken 4610 tons for the Sixth avenue subway, New York. At 1.90c, base, Pittsburgh, shapes are without quotable change.

Cleveland — While some fabricators, operating at capacity, are booked until the first of the year, they continue to bid on small jobs. Bethlehem Steel Co., Bethlehem, Pa., was awarded the steel for the Wood county state highway bridge, involving 613 tons.

Chicago—Awards continue light and well below the volume of several months ago. Backlogs of fabricators are receding. Plain shapes are being continued 1.95c, Chicago.

Boston—Last week brought a large total tonnage nearer to bookings by fabricators. Boston Bridge Works Inc. booked 710 tons on four Massachusetts bridges. Some fabricators look for a lull in bookings after the present pending projects are closed.

Philadelphia—Activity in the anthracite coal region features the structural market, three projects, aggregating close to 1000 tons, having recently been placed. Outstanding also is state bridge work, with bids being asked Oct. 9 on several jobs also totaling approximately 1000 tons.

New York—Lettings of structural shapes were considerably higher last week than in the week before, but additions to the active pending lists were smaller. It is indicated structural fabricators will be busy during October.

Tonnage booked by the steel construction industry during August was 95,390, compared to 188,053 tons

Shape Awards Compared

	Tons
Week ended Oct. 2	19,345
Week ended Sept. 25	12,626
*Week ended Sept. 18	36,937
This week, 1935	20,665
Weekly average, 1935	17,081
Weekly average, 1936	22,772
Weekly average, September	19,999
Total to date, 1935	655,065
Total to date, 1936	910,879

*Revised.

in July, according to the American Institute of Steel Construction. Shipments fell from 147,824 tons in July to 127,106 in August. Total new business for the first eight months this year was 55.2 per cent of normal. Tonnage available for fabrication during the next four months was estimated at 952,344.

St. Louis—Operations at fabricating plants have been reduced from 75 to 60 per cent of capacity. Backlogs have been cut and large projects are lacking. Missouri and Illinois road work may revive business soon.

San Francisco—Little new work has developed, though pending business exceeds 22,000 tons. Awards aggregated 442 tons and brought the total for the year to 138,278 tons, compared with 82,928 tons for the same period in 1935.

Seattle—Plants generally are busy, but not outstanding projects are up for figures. The week's awards included 200 tons for sheds for Acme Packing Co., Seattle, and 100 tons for government bridges in Alaska. Washington state opens bids Oct. 6 for a Kittitas county highway project, for 188 tons shapes and 100 tons steel piling.

Shape Contracts Placed

4610 tons, Sixth avenue subway, route 101, section 8, New York, to Bethlehem Steel Co., Bethlehem, Pa.

1500 tons, 17-story apartment, Madison avenue and Seventy-second street, New York, to Harris Structural Steel Co., New York.

1500 tons, factory building, Owens-Illinois Can Co., Baltimore, Md., to Bethlehem Steel Co., Bethlehem, Pa.

1370 tons, Hayfield pumping plant for Metropolitan water district, Los Angeles, to Consolidated Steel Corp., Los Angeles.

855 tons, plant extension for Libbey Glass Co., Toledo, O., to Bethlehem Steel Co., Bethlehem, Pa.

800 tons, Williamsburg bridge floor support, to Carnegie-Illinois Steel Corp., Pittsburgh.

800 tons, plaza construction, midtown-Hudson tunnel, Weehawken, N. J., for Port of New York authority, to American Bridge Co., Pittsburgh, through G. M. Brewster Son Co.

700 tons, trash racks, Fort Peck dam, Wiota, Mont., to A. J. O'Leary & Son Co., Chicago.

630 tons, bridge, Richmond, Tex., to Capital Steel & Iron Co., Oklahoma City, Okla.

613 tons, Wood county, Ohio, state highway bridge, to Bethlehem Steel Co., Bethlehem, Pa.

585 tons, building, Peoria, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

560 tons, Queens shaft, Queens-Midtown tunnel to Jones & Laughlin Steel Corp., Pittsburgh, through G. A. M. Construction Co., New York.

500 tons, new office and industrial building for Wm. S. Merrell Co., Reading, O., to L. Schrieber & Son Co., Cincinnati.

450 tons, boiler house, Glen Alden Coal Co., Ashley, Pa., to Reading Metal Craft Co., Reading, Pa., through A. J. Sordoni, Kingston, Pa., general contractor.

410 tons, column heads, Williamsburg housing project, New York, for United States government, to American Car & Foundry Co., New York.

400 tons, coal breaker, Stevens Coal Co., Shamokin, Pa., to Bethlehem Fabricators Inc., Bethlehem, Pa.

400 tons, Ashtabula county, Ohio, state highway bridge, to United States Engineers & Constructors Inc., Chicago.

350 tons, junior high school, Ogdensburg, N. Y., for board of education, to Syracuse Engineering Co., Syracuse, N. Y.

350 tons, Diversey housing project, Chicago, for United States government, to Bethlehem Steel Co., Bethlehem, Pa.

260 tons, temporary bridge, Westchester avenue over Bronx river, Bronx, N. Y., to Bethlehem Steel Co., Bethlehem, Pa., through Centaur Construction Co., New York.

240 tons, plant extension for Worthington Pump & Machinery Corp., Buffalo, to Fort Pitt Bridge Works, Pittsburgh, through Austin Co., Cleveland.

225 tons, bridge, New York, New Haven & Hartford railroad, Orms street, Providence, R. I., to Boston Bridge Works Inc., through M. A. Gammino Construction Co., Providence.

200 tons, state bridge, Standish, Me., to Boston Bridge Works Inc., Cambridge, Mass.

200 tons, sheds for Acme Packing Co., Seattle, to Pacific Car & Foundry Co., Seattle.

175 tons, state bridge, Bangor, Me., to Boston Bridge Works Inc., Cambridge, Mass.

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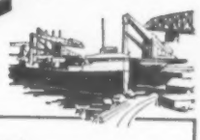
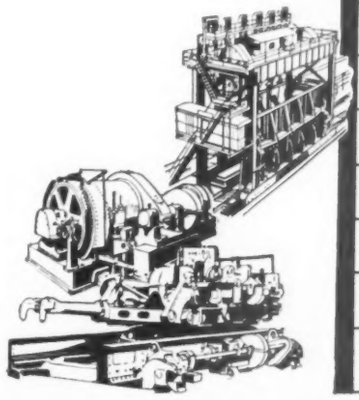


When you are faced with the necessity of reducing costs or increasing output, or both, ask Wellman engineers for their recommendation. No other single manufacturer has equalled Wellman accomplishments in solving problems arising in handling and production.



- Steel Mill Equipment
- Charging Machines, Cars and Boxes
- Manipulators
- Coal and Ore Handling Bridges
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- Car Dumpers, all types
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- Gas Reversing Valves
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- Mining Machinery
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- Castings and Machine Work to customers' drawings.

THE WELLMAN ENGINEERING CO.

ENGINEERS CONSTRUCTORS MANUFACTURERS

WELLMAN

CLEVELAND, OHIO

BIRMINGHAM · NEW YORK · MEXICO CITY

162 tons, six state bridges in three counties, California, to unnamed interests.

125 tons, warehouse, F. H. Morris Co., Philadelphia, through Cantley & Co., contractor, that city, to Morris Wheeler & Co., Philadelphia.

115 tons, I-beam spans for the Pennsylvania state department of highways in Wayne, Bradford and Potter counties, to Bethlehem Steel Co., Bethlehem, Pa.

110 tons, state bridge, Canton-Norwood-Westwood, Mass., to Boston Bridge Works Inc., Cambridge, Mass., through Martine-DeMatteo, Roslindale, Mass.

100 tons, extension to crane runway, Alan Wood Steel Co., at Ivy Rock, Pa., to Belmont Iron Works, Eddystone, Pa.

100 tons, state bridge, Somerset county, Pennsylvania, to American Bridge Co., Pittsburgh.

100 tons, conveyor supports, Lehigh Navigation Coal Co., Tamaqua, Pa., to Bethlehem Contracting Co., Bethlehem, Pa.

100 tons, government bridges in Alaska, to Pacific Car & Foundry Co., Seattle.

100 tons, addition to plant of Olympia Brewing Co., Olympia, Wash., to Isaacson Iron Works, Seattle.

Shape Contracts Pending

2000 tons, state grade crossing elimination, Buffalo; John W. Cowper Inc., Buffalo, low.

1860 tons, state bridge, Deerfield-Sunderland, Mass.; C. J. Maney & Son Inc., Boston, low.

1800 tons, transmission towers, Safe Harbor, Pa., for Pennsylvania Water Power Co.

1275 tons, bridge, Lewiston, Me.; Phoenix Bridge Co., Phoenixville, Pa., low.

1220 tons, steel viaduct, Wilkes-Barre, Pa.; bids to state highway department, Harrisburg, Pa., Oct. 16.

1100 tons, steel piling, boulevard bridge, Queens, N. Y.; bids to be taken Oct.6 by New York public works department.

1000 tons, approximately, state bridges, Pennsylvania; bids to be opened Oct. 9.

900 tons, superstructure bridge No. 146, Boscobel, Wis.; bids Oct. 9.

600 tons, addition to American Blower Corp. plant, Dearborn, Mich.; Stone & Webster Engineering Corp., New York, general contractor.

575 tons, state bridge, Fayetteville, N. C.; bids opened Oct. 1.

550 tons, bridge, Raritan overpass, South Amboy, N. J.; Franklin Contracting Co., Jersey City, N. J., low.

348 tons, four underpass bridges, Saugus, Mass.; B. Perini & Son, Boston, low.

345 tons, school, St. Clair, Pa.; Berwick Lumber & Supply Co., Berwick, Pa., general contractor.

328 tons, state bridge over Nashua river, Clinton, Mass.; A. Singarella, Framingham, Mass., low.

310 tons, grade crossing elimination, Scottsville, N. Y., for Pennsylvania railroad.

280 tons, bridge, Wallington, Vt.; Joseph P. McCabe, Boston, general contractor.

250 tons, addition to West Side main mill, Waterville, Conn., for Chase Brass & Copper Co.

169 tons, and 53 tons steel piling, two bridges, Malden-Revere, Mass.; C. G. Maney Co. Inc., low.

160 tons, including piling, Ray street pumping station, Spokane; Alloway Georg, Spokane, general contractor.

150 tons, Bronx eye and ear infirmary, Bronx, N. Y.; bids Oct. 8.

125 tons, renewal of lattice girders, Sixty-third street, Chicago Rapid Transit.

125 tons, approximately, school, Reading, Pa.

123 tons, plate girder bridge, Elk county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 16. Included, 34 tons of plain steel bars.

122 tons, state bridge, Cocasset street, Foxboro, Mass.; Coleman Bros. Corp., Boston, low.

112 tons, bridge, Millbury-Sutton, Mass.; New Haven Road Construction Co., New Haven, Conn., low.

110 tons, plain structural steel, I-beam bridge, Center-Clearfield counties, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 16.

102 tons, fabricated structural steel, pony truss bridge, Huntington county, Pennsylvania; bids to state highway department, Harrisburg, Pa., Oct. 16. Included, 13 tons of plain steel bars.

100 tons, highway work in Gilpin county, Colorado; bids Oct. 8.

100 tons, bridge for Pittsburgh & Lake Erie railroad, Rankin, Pa.

100 tons, overpass, Sharon, Mass.; B. F. Construction Co., New Bedford, Mass., low.

Unstated tonnage, building, Tude Reduction Corp., Newark, N. J.

Unstated tonnage, building, Federal Paper Board Co., Bogota, N. J.

Unstated tonnage, reconstruction of railroad bridge, Belmar, N. J., changing fixed span to bascule type; approximately $280,000 will be spent.

Behind the Scenes with STEEL

New Dress

IF THIS issue of STEEL looks different to you, let us hasten to explain that it has been set in an entirely new face of linotype from stem to stern. Known as Regal, the new face has been cut only recently by the Intertype Corp., Brooklyn, N. Y., and is designed to be much more easily and quickly readable.

Installation of the new type face is part of a program of complete rehabilitation by our printing department. New makeup stones, type cabinets, furniture cabinets, galleys and a lot of other stuff which we don't know what to call (all steel, incidentally) has been set in place, and the composition and printing departments are now ready to click in a big way.

* * *

Reader Tells All

EXCERPT from a recent letter received from a Chicago manufacturer: "We are subscribers to STEEL and this publication receives more attention here than do most publications. After it is turned over to me by the mailing department, I scan it for competitive ads or for publicity and for materials handling installation articles. When I get through with it, I turn it over to our purchasing department where it is again thumbed through. The next stopping place is the engineering department, for our engineers usually set up a 'howl' if they are overlooked as they are particularly interested in the automotive news and are now also giving special attention to your new Materials Handling section, upon which we look most favorably."

* * *

INQUISITIVE CAMERA DEPT. XVII

DONALD R. "DON" JAMES, former newspaperman and news hawk for the Associated Press, who has recently been appointed to the STEEL *staff as associate editor.*

Attention, Inventors

MARCH of progress in automotive circles has a keen student in Bob Hartford of STEEL's editorial department. Gazing into the crystal ball, he discerns two important gadgets for cars of the future—silent horns for use in New York to conform with anti-noise regulations; and black headlamp bulbs for the driver coming toward you in the dark.

Bob also says the trailer people deserve a big hand for putting the back seat so far in the rear that no one—not even the well-known mother-in-law—can drive from it.

* * *

Cook on Loose

PURSUING an old habit of ours, browsing around in the classified ads in STEEL, we noted recently that the "steward of a private club desires cafeteria and restaurant concession in a steel plant." He claims he is well experienced in satisfying manual workers and office staff.

If he is going to attempt to hold down both jobs, we hope he never makes the mistake of serving *pate de foie gras avec sauce meuniere* to the gang on the soaking pits and Mulligan stew to the bankers' table at the club.

* * *

Into the Fold

TALK about fitting a name to a job, did you know that J. P. Gatherum is personnel director for Great Lakes Steel Corp., Detroit?

* * *

Heads Up

HEADLINE of the week: *Yearmarks of Experience* — Valley Mould & Iron Co. in the Sept. 14 issue. A double-peachy, if we may use the term.

—SHRDLU

Reinforcing

Reinforcing Bar Prices, Page 69

Pittsburgh—Last week the Harrisburg, Pa., highway department issued an inquiry which included 667,792 pounds for Luzerne county, 91,083 pounds for Clearfield county, and several lots for other counties. The market of 2.05c, f.o.b. Pittsburgh, as quoted by distributors for cut lengths, new billet quality in carload lots, and 1.90c for rail quality bars have both been reaffirmed definitely for fourth quarter, with the jobber's allowance in each case 30 cents less for stock lengths.

Cleveland—New projects requiring 100 tons or more of new billet reinforcing bars have been lacking for some time now. Estimated requirements during September for both billet and rail bars, from private sources, are approximately 146 tons, compared with 548 tons in August.

Chicago—Despite some decrease in the volume of new business in concrete bars, shipments continue heavy and backlogs are sufficient to support an active movement through October. The market nominally is 2.10c for billet reinforcing bars and 1.95c for rail steel.

Boston—Announcement of low bidders on four bridge projects in Massachusetts involving 689 tons of concrete bars is the highlight in the market here. Although prices generally are firm, some shading up to $4 a ton is being done.

New York—Awards were down from the previous week, and inquiries were lighter. Rail steel is said to have been cut up to $10 under the base price, and new billet steel up to $7.

Philadelphia—Dullness dominates the reinforcing bar market, with outstanding jobs few and far between. A warehouse here for the North American Warehousing Co. is the largest pending project, requiring between 800 and 1000 tons, according to present estimates.

San Francisco—While pending business aggregates well over 11,000 tons, few awards of size have been reported placed. To date 193,510 tons have been booked, compared with 180,688 tons last year. Unnamed interests took 288 tons for relining the Zion National Park road in Washington county, Utah. Bids will be opened Oct. 15 for 1700 tons for lining and roofing the University Mound reservoir, San Francisco.

Seattle—Important tonnages are not numerous but local mills still have fair backlogs and small jobs have been taken in increasing number. Business pending approximates 1000 tons, the largest 325 tons for the Union avenue state bridge, Tacoma, awarded to Rumsey & Co., Seattle, at $108,845.

Concrete Awards Compared

	Tons
Week ended Oct. 2	3,258
Week ended Sept. 25	11,353
Week ended Sept. 18	8,834
This week, 1935	2,550
Weekly average, 1935	6,862
Weekly average, 1936	6,703
Weekly average, September	6,987
Total to date, 1935	270,001
Total to date, 1936	268,102

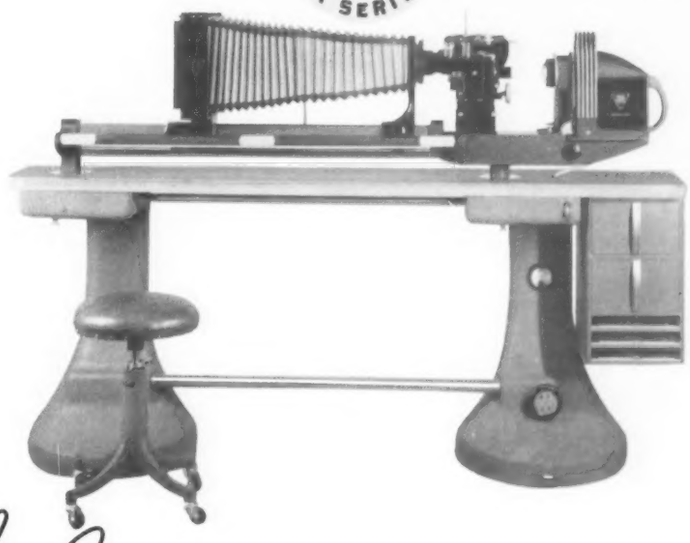
Reinforcing Steel Awards

1100 tons, west side elevated, from Ninety-ninth to 111th streets, New York, to Fireproof Products Co., New York, through Debaso Construction Co.

850 tons, General Motors Corp. plant at Linden, N. J., to Taylor & Gaskin, Detroit, through J. A. Utley, Detroit, general contractor.

300 tons, Triborough bridge contract No.

METAL NUMBER TEN OF A SERIES SHOW



An Invitation TO A CONFERENCE ON YOUR PROBLEMS

You have been reading a series of these messages informing you about the use of optical instruments in your plant. Now we take advantage of the opportunity offered by your attendance at the Metal Show to invite you to introduce yourself to the B & L Representatives at the B & L Booth.

You, and these engineers can get your heads together in a secluded corner of the booth and do a lot toward solving some of your troublesome problems. The B & L Men will be frank to tell you whether or not optical instruments will aid you and which optical instrument will best answer your requirements.

Your conversation will be treated with strict confidence and when you leave you need feel under no obligation whatsoever.

So let's get acquainted at the B & L Booth No. D23 at the Metal Show for our mutual benefit.

Whether you have an appointment or not, be sure to take advantage of the opportunity to see the B & L Instruments on display.

Ad No. 11 will compare B & L Microscopes for use in the shop.

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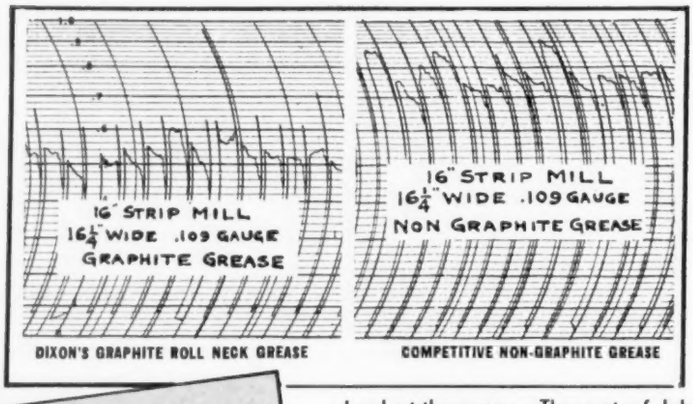
66, to Fireproof Products Co., New York, through Corbetta Construction Co., New York.
288 tons, relining tunnel on Mt. Zion national park road, Washington county, Utah, to unnamed interest.
270 tons, New Jersey state paving, route 25, section 26, to Joseph T. Ryerson & Son Inc., Chicago, through Tidewater Stone & Supply Co., Hackensack, N. J.
140 tons, store, Oak Park, Ill., to Joseph T. Ryerson & Son Inc., Chicago.
110 tons, bridge RC-3809, Cattauraugus county, New York, to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, state road work, Lehigh county, Pennsylvania, through the Union Paving Co., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.
100 tons, state highway bridge, Canton-Norwood-Westwood, Mass., to Northern Steel Co., Boston, through Martine-DeMatteo, Roslindale, Mass.

Reinforcing Steel Pending

1700 tons, lining and roofing, University Mound reservoir, San Francisco; bids Oct. 15.
645 tons, substructure, pier No. 19, San Francisco; general contract to Ben C. Gerwick, San Francisco.
520 tons, refinery, Spreckles Sugar Co., Woodland, Calif.; bids being taken.
380 to 400 tons, warehouse, Coffin, Redington Co., San Francisco; bids opened.
359 tons, miscellaneous projects, treasury department; W. Ames Co., Newark, N. J., low.
334 tons, concrete and steel viaduct, Wilkes-Barre, Pa.; bids to state highway department, Harrisburg, Pa., Oct. 16.
325 tons, state bridge, Union avenue, Tacoma, Wash.; Rumsey & Co., Seattle, general contractor.
300 tons, state bridge, Deerfield-Sunderland, Mass.; C. J. Maney & Son Inc., Boston, low.
274 tons, WPA project, New Orleans; Dudley Bar Co., Chattanooga, Tenn., low.
222 tons, state hospital, Talmadge, Calif.; general contract to K. E. Parker Co., San Francisco.
215 tons, bridge, South Amboy, N. J.; Franklin Contracting Co., Jersey City, N. J., low.
209 tons, sea wall, Newport Beach, Calif.; new bids Oct. 5.
190 tons, United States engineer's office, Milwaukee; bids closed Oct. 2.
185 tons, four state bridges, Saugus, Mass.; B. Perini & Son Boston, low.
178 tons, Broadway low level tunnel, Oakland, Calif.; bids Oct. 6.
125 tons, addition to Washington Cooperative Egg plant, Seattle; bids in.
120 tons, Washington state bridge and highway projects; bids at Olympia, Wash., Oct. 6.
106 tons, two bridges and underpass, Barber's crossing, Worcester, Mass.; B. Perini & Son, Boston, low.
100 tons, state bridge over New Haven railroad, Attleboro, Mass.; B. Perini & Son, Boston, low.
100 tons, state soldiers' home, Retsil, Wash.; bids in.
Unstated tonnage, bridges in Linn and Wallowa counties, Oregon; bids in.



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JOSEPH DIXON CRUCIBLE CO. JERSEY CITY, NEW JERSEY

DIXON'S GRAPHITE PRODUCTIONS

SEND FOR CIRCULARS

Pig Iron

Pig Iron Prices, Page 70

Pittsburgh—Heavy pig iron shipments continue unabated although the absence of open inquiry in the market is still noticeable. Pittsburgh Coke & Iron Co. stacks at Neville Island and Sharpsville, Pa., as well as Shenango Furnace Co.'s Sharpsville, Pa., stack will soon be augmented by blowing in of the Struthers Iron & Steel Co.'s furnace at Struthers, O. Prices are steady.

Cleveland — Merchant producers here report an approximate 20 per cent increase in shipments during September over August, despite the absence of demand from auto foundries. The increase is credited to the scarcity of scrap and secondly because of the feeling that pig iron prices may advance in the near future.

Chicago — September pig iron shipments were about 20 per cent heavier than those of August, with a further increase in sight for October. New business in some instances represents consumers' requirements into first quarter. Factors contributing to forward buying, are the possibility of a future price increase and fears of labor trouble and a freight car shortage. Lake Superior charcoal iron has been advanced 50 cents a ton, to $22.50, furnace, or $22.7528, delivered Chicago.

Boston — Increased demand for textile machinery, valves, machine tools, and other commodities in which castings are involved, is responsible for the heavy demand for pig iron. There is some talk of increasing prices in the middle of the quarter.

New York—While trading over the past week tapered off, pig iron sellers regard the lull as temporary. Unless political factors become more pronounced as election approaches, October should exceed September business.

Philadelphia — Having concluded an active month in September, pig iron sellers are looking for business to be sustained at least in October. In fact, with the time approaching when an advance in prices may be announced, it is believed logical that business, if anything, should be more active.

Buffalo—Bethlehem Steel Co. now has its fifth blast furnace in full production bringing the number of active stacks here up to 11. Another producer is preparing a blast furnace for production, but no date has been set for its start. Heavy shipments were made in September.

Youngstown, O.—Revival in the pig iron market is becoming more

apparent in the gradual elimination of stocks. Struthers Steel & Iron Co. now plans to relight its Struthers, O., stack, soon.

St. Louis — Producers and distributors report substantial purchasing for fourth quarter and numerous melters who had covered full requirements are placing orders for additional tonnages. September shipments were the largest this year with exception of March.

Seattle—Fourth quarter pig iron prices are unchanged at $17.50 base, Provo, Utah, for 1.75 to 2.25 silicon. Foundries are busy, and consumption of iron is steady. British coke is unchanged at $14.50, buyer's plant.

Toronto, Ont.—Improved business in the Canadian iron and steel market is reflected in stronger demand for pig iron. Sales last week passed the 800-ton mark. Production is also running at a higher level than in August, with four stacks again blowing. Prices are firm, with higher levels in prospect.

Scrap

Scrap Prices, Page 71

Pittsburgh—Shipping restrictions on many grades of remelting scrap, chief among which are No. 2 grades, have imparted a softer tone to the market, although by comparison No. 1 steel retains a comparatively firm showing at an unchanged $18 to $18.50 level. Hand bundled sheets, flashings, and No. 2 heavy melting steel are now quoted at $16 to $16.50.

Chicago—Scrap shows a slightly easier tone here, reflected principally in lower bids by brokers and dealers. The consumers' market for heavy melting steel continues $16 to $16.50, but whereas sellers recently were covering orders for this grade at $16.50 and higher, material now is available at $16 to $16.25. Consumption continues heavy both at steelworks and foundries.

Boston—The upward trend of scrap prices in this district was halted last week, and on three items brokers' buying prices for domestic consumption were reduced 25 to 50 cents a ton. This brought out large quantities. Cast borings for steelworks are down 25 cents to the $6-6.25 range. Forge flashings $9.75-10.00. Skeleton also is down 50 cents to $9.75-10.00.

New York—Scrap prices moved upward 25 cents to $1 again last week as strong demand continued. Foundry stove plate for domestic consumption is quoted at $10.00 flat, up from $8.75-9.25. Stove plate for export is up $1 to $10.00. Schiavone-Bonomo Corp. has officially booked the contract for scrapping nine government ships on its high bid of $116,250.

Philadelphia—For the first week in some time scrap prices throughout the list are unchanged and supplies are coming out more freely. Few outstanding sales have been made over the past few days.

Detroit—The reaction of accumulated shipping supplies at outside scrap consuming districts continued to affect the local market last week, with the result that remelting scrap prices were unchanged. Apparently many scrap brokers for the first time since early in June have attained a moderately long position.

Cincinnati—A lull in buying in the valley, combined with prolonged absence, for tonnage supplies, of district consumers has brought a weaker iron and steel scrap market.

St. Louis—The steady advance in scrap has been checked. Prices generally are unchanged, an exception being certain grades of heavy melting, lowered 25c a ton. The melt holds up well, and indications point to heavy schedules in casting plants working on railroad business.

Seattle—Although Japan indicated renewed interest two weeks ago, inquiries decreased last week and exporters assume Japanese buyers are hoping for lower prices. Domestic volume is steady. Local mills are paying $10 for No. 1 and $8 for No. 2. Export levels are unchanged at $10.50. Tidewater stocks are low.

Toronto, Ont.—Trading in iron and steel scrap continues steady with minor improvement reported in sales for the past week. Good shipments, chiefly heavy melting, are being made to the Hamilton district. There also is good call in Montreal. Price lists are up for revision and new quotations are expected soon.

Bolts, Nuts and Rivets

Bolt, Nut, Rivet Prices, Page 69

September business in bolts and nuts showed a moderate gain over August. Consumption by railroad equipment builders and car shops is holding at a relatively high rate, while needs of tractor and farm implement manufacturers have been increased moderately. In the Cleveland district shipments are up 10 per cent over August, sales about 20 per cent. Fourth quarter contracting is practically complete. Rivet prices are holding but some irregularity continues in bolts and nuts.

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Warehouse

Warehouse Prices, Page 72

Pittsburgh—The advance in warehouse steel prices Oct. 1 now names, for Pittsburgh district shipment, bars and small shapes, 3.15c and 3.30c, depending upon classification; cold-drawn bars, 3.60c; No. 24 hot-rolled annealed sheets, 3.45c; and forging quality hot-rolled bars, 3.35c.

Cleveland — Warehouse distributors here report a slight increase in shipments during September over the preceding month. This is credited to the delivery situation in most mills.

Chicago—Warehouses have instituted higher prices on those commodities affected by recent mill revisions, including bars, billets, merchant wire, spikes, bolts and hot-rolled annealed sheets. Gage differentials on heavy hot-rolled sheets have been increased.

Boston—Warehouse prices have been advanced to conform with recent increases in mill prices. Mild steel bars and bar shapes are now quoted at 3.30c; hex, bar tees and zees at 3.55c; half rounds, half ovals, ovals and bevels at 4.55c; round edge tire steel at 4.55c; No. 24 gage one pass cold rolled sheets at 4.05c; No. 24 uniform blue sheets at 4.55c; and cold rolled finished rounds, squares, hexagons and flats at 4.15c.

New York — Warehouse sales spurted last week as buyers covered on articles affected by price advances. Altogether sales were somewhat lower in September, as contrasted with the unusually good August.

Philadelphia—Advances of $2 a ton on iron and steel commercial bars, cold-drawn carbon bars and No. 24 hot annealed sheets have gone into effect. September business exceeded August.

Baltimore—While prices to date are unchanged, an increase is expected shortly on soft steel bars, small shapes, cold drawn bars and light black sheets. Business has undergone a slight lull in the past few days, but trading for the month just closed has been good.

Detroit—For delivery in metropolitan Detroit district, soft steel bars quoted 3.29c; S. A. E. 1035 forging quality bars, 3.44c; and billets, 0.15 to 0.25 carbon, 3.35c. Cold-drawn bars are quoted at 3.84c, and 24 gage black sheets at 4.14c.

Cincinnati—Warehouse sales increased during the latter part of September. The new price schedule shows advances in accord with mill announcements, other quotations reaffirmed.

St. Louis—Preliminary reports of warehousemen indicate a fair increase in September volume over August. Prices on certain commodities advanced by the mills as of Oct. 1 have been adjusted to meet the higher levels. Quantity extras on hot-rolled sheets have been revised; galvanized and cold-finished sheets not affected.

Seattle — Warehouse sales in September were heavy. Merchant bars, plates and sheets are in best demand. Prices are unchanged, although shafting may be advanced to meet higher mill prices.

Semifinished

Semifinished Prices, Page 69

The price advance on wire rods was met by eagerness on the part of consumers to place their specifications prior to Oct. 1. On all business not so covered, the advanced market now names $40, f.o.b. Pittsburgh, for Nos. 4 to 5 wire rods, and $42, Pittsburgh, for No. 5 to 47/64-inch. Consumers had been posted of the anticipated change in sheet bars,

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rerolling billets, blooms, and slabs, far enough in advance, and had entered specifications accordingly.

Steel in Europe

Foreign Steel Prices, Page 72

London — (*By Cable*) — Markets are active, but production is barely sufficient to meet requirements. A larger foreign import quota is expected. Some contracts have been booked to the end of March at current prices. The Spanish situation continues to affect ore supply works, although ore stocks are still plentiful. The tinplate trade is fair and galvanized sheet exports are improving. The Continent reports export business is calmer. Sales of merchant bars to South America are active, while Germany is selling special steels, bands and tubes to Japan.

Iron Ore

Iron Ore Prices, Page 71

New York—Prices on Russian ore, 50 to 52 per cent manganese contained, advanced Friday one cent per unit to 27 cents, not including duty. This raises the price to a parity with the nominal 27 cents being quoted on South African manganese. All other ore prices are unchanged.

Ferroalloys

Ferroalloy Prices, Page 70

New York — Ferromanganese sellers look for shipments continuing at the substantial rate of the last several months in view of prospects for continued high steelmaking operations. Prices are firm at $75, duty paid, Atlantic and Gulf ports. Domestic spiegeleisen, 19 to 21 per cent, is holding at $26, Palmerton, Pa., on lots up to 50 tons and $24 on 50 tons and over.

Metallurgical Coke

Coke Prices, Page 69

Some by-product coke oven operators in the Pittsburgh district are working on needed repairs in view of the continuing heavy demand for metallurgical coke. Beehive operators who are also confident of a sustained demand are likewise repairing long unused facilities. Carnegie Illinois Steel Corp. is operating all of its 1482 ovens at the Clairton works, although Jones & Laughlin Steel Corp. still has a battery at Aliquippa which is not being used and the Alicia, Pa., ovens of Pittsburgh Steel Co. are inactive as the later is now using beehive coke in some quantity. Standard furnace coke, beehive quality, appears to be ranging around $3.75 to $4 a ton, f.o.b. ovens, although sellers are asking $4 on all new inquiry. Common foundry coke remains at around $4.25 a ton.

Coke By-Products

Coke By-Product Prices, Page 69

Most eastern producers of by-product foundry coke have advanced prices 50 cents a ton. As a result, delivered Newark, N. J., prices are now $10.20 to $10.65 and delivered Philadelphia prices $9.88. New England prices also are advancing, and while at the moment a spread of $11.50 to $12, delivered, appears representative, a flat $12 price is believed likely soon.

At Chicago, however, by-product foundry coke prices have been extended. Shipments increased moderately during September in the middle west. Buffalo is importing coke in large quantities to supply its blast furnaces and domestic needs. From April to August, inclusive, coke receipts at Buffalo amounted to 2721 cars or 92,390 tons.

Nonferrous Metals

Nonferrous Metal Prices, Page 70

New York—Metal markets were turbed early last week by gold-bloc devaluations and uncertainties but this situation became clearer and the greater value of commodities compared with inflated gold bloc monies became more certain toward the end of the period. American producers have shown no great concern over the threat of metal importations.

Copper—Lower prices abroad dispelled completely any expectations of an immediate advance in domestic quotations. Apparent consumption is held steady with the trend upward. Electrolytic held at 9.75c, Connecticut.

Lead—Demand was fairly active but spotty with one leading producer again limiting sales to regular customers. Undertone was strong but prices held firm at 4.45c, East St. Louis.

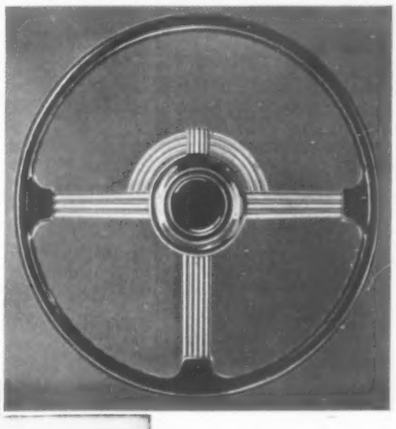
Zinc—Fresh demand remained generally light but prime western was steady at 4.85c, East St. Louis. London prices slipped well under parity with New York levels but there was no move toward lowering quotations here.

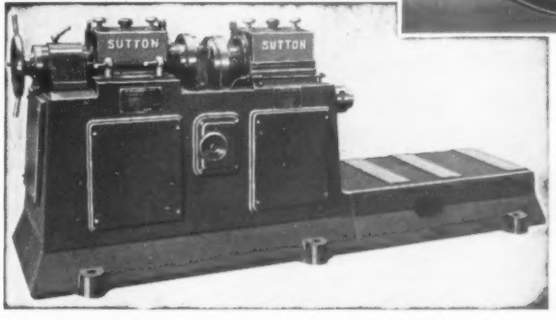
Tin—Straits tin prices strength-

The new type Chrysler steering wheel shown at the right is not only unique in design but it presents a difficult polishing and burnishing problem.

The No. 00 Sutton Disc Type Burnishing and Surface Rolling machine seen below successfully met the requirement. It polishes and burnishes in one operation by spinning the spokes between two hardened discs. No emery belt is used.

This is the only machine of its kind on the market. Write for details.





Other Sutton machines are:

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ened on "bullish" world statistics for September showing light Straits shipments, active consumption here, and a further cut in world visible supplies. Outlook for extension of the control plan improved. Spot closed around 45.45c.

Antimony — American spot advanced ¼-cent on Monday and 3/8-cent on Tuesday but reacted ¼-cent on Thursday. The close was steady at 12.25c. Chinese spot held nominally unchanged at 12.50c, duty paid New York.

Housing Project Develops $4,992 as Steel Home Cost

Construction cost figures recently released by the Purdue Housing Research Project, sponsored by Purdue university, Lafayette, Ind., show that a house built mainly of steel cost $4992, exclusive of land and grading. The house is one of five erected in 1936 for research purposes.

The position of the average home owner was assumed as far as possible by heads of the project, and contractors' bids were asked and contracts let in the usual manner, without labor or price concessions. Five requirements have been established for houses built by the project: Cost not to exceed $5000; each house to be basically different in construction and plan; accommodations to be sufficient for an average family or parents and two or more children, with garage.

The cost breakdown shows steel panel sections and labor cost $1696.25, or 34.05 per cent of the total cost. Significantly, overhead and profit amounted to only $223.80, or 4.50 per cent. This figure, however, is not considered a fair return for detailed work and supervision, according to C. Paul Ulmer, technical assistant to the project, since the competitive conditions which caused close bidding may not always exist in all localities.

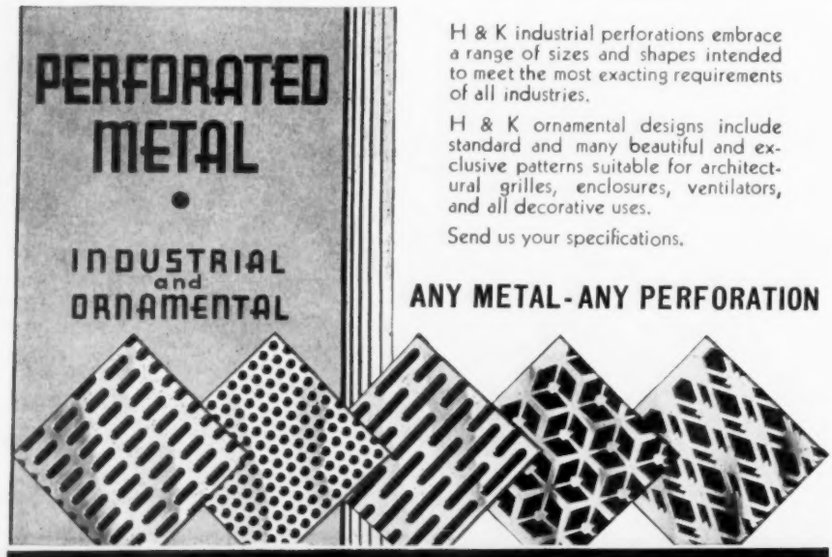
Gross area of the house is 1289 square feet, a cost of $3.90 per square foot. Cubic content is 13,850 cubic feet, at $0.36 per cubic foot. The house, designated as No. 4, was designed and constructed by Insulated Steel Construction Co., Middletown, O., and supervised with time studies by the project.

Imports Up 173% in First Year of Belgian Trade Pact

Imports from all sources of iron and steel products on which import duties were reduced by the reciprocal trade agreement with Belgium, increased 173 per cent in value during the first year of the agreement, according to a comparison made by American Iron and Steel Institute based on official statistics.

Under the reciprocal trade agreement act the terms of the agreement relative to reduced duties applied to imports not only from Belgium but also from all other countries.

In the 12-month period following May 1, 1935, when the Belgian agreement became effective, $2,310,000 worth of the iron and steel products covered by the agreement was imported into the United States from all countries. The tonnage represented was 68,656 gross tons. In the year preceding the treaty imports of those products aggregated only 26,976 gross tons valued at $845,000.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Financial

WORTHINGTON Pump & Machinery Co., Harrison, N. J., has called a stockholders meeting Nov. 9, to consider formation of a new company under Delaware laws, to take over assets of the present company, incorporated in Virginia. This is said to be preliminary to a plan for recapitalization.

Stockholders of Vanadium Corp. of America have approved a proposal to reduce stated value of capital to $3,783,673 from $11,351,020. The action was taken to eliminate profit and loss deficit of $4,172,973 as of June 30 last.

NATIONAL ACME TO CUT BOND DEBT

National Acme Co., Cleveland, has announced plans to reduce bonded debt. In December, 1921, the company issued $5,000,000 first mortgage bonds, reduced to $2,000,000 in December, 1927. Bonds since have been reduced to $1,577,000, and the purpose is to reduce this amount to $750,000, to extend the maturity from Dec. 1, 1942, to Dec. 1, 1946, and to reduce the interest rate from 6 to 4½ per cent. Bonds will continue to be secured under first mortgage. Other details provide for a sinking fund of $25,000 a year the first two years, and $100,000 annually the second five to be paid semi-annually March 1 to Sept. 1, 1937. In the event holders seek to have bonds extended in a total amount over $750,000, bonds will be accepted by lot at the discretion of the company.

CLARK CONTROLLER VOTES BONUS TO EMPLOYES

Clark Controller Co., Cleveland, has approved an $85,000 Christmas bonus to employes. Stockholders also ratified a change in common capital from 50,000 shares no par to 250,000 shares, par $1, and voted to split the new stock three for one. Earnings for the eight months to Aug. 31 totaled $341,954. After allowing $50,000 for taxes and $56,600, which is two-thirds of the bonus, there remained $235,287. This is equal to about $1.40 a share for the eight months.

FINANCIAL NOTES

Directors of National Malleable & Steel Castings Co., Cleveland, declared a dividend of 65 cents, payable Oct. 25 to stock of record Oct. 10.

* * *

Apex Electrical Mfg. Co., Cleveland, declared a quarterly dividend of $1.75 and a dividend of $3.50 on account of accumulation on prior preferred, both paid Oct. 1, to stock of record Sept. 21. After this payment, total arrearage will amount to $3 per share.

* * *

A. O. Smith Corp., Milwaukee, reports net income of $862,659 for the year ended July 31. This compares with a net loss of $621,305 for the previous fiscal year.

* * *

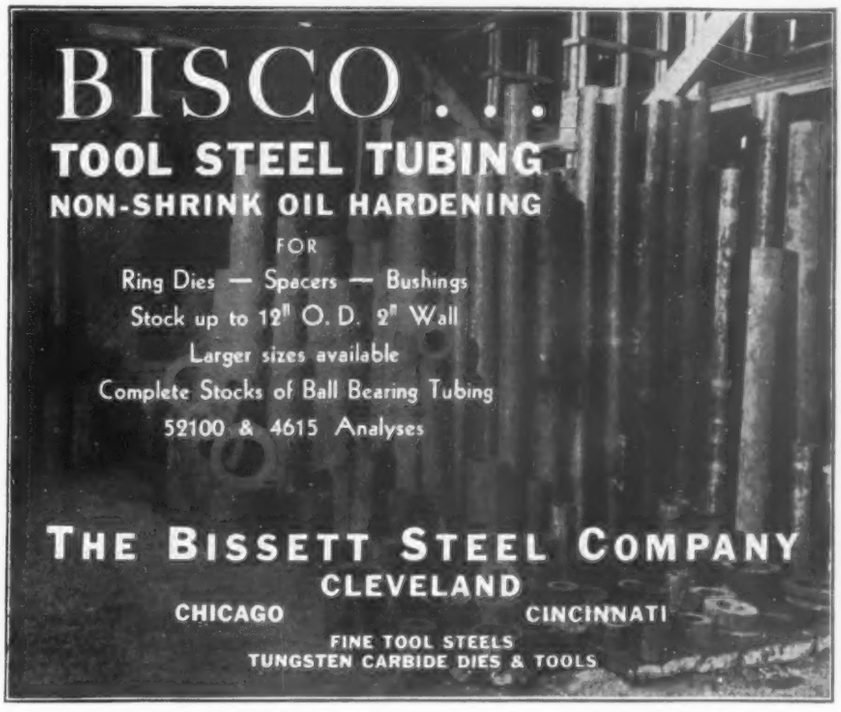
Pittsburgh Screw & Bolt Corp., Pittsburgh, has notified the trustee under the bond indenture of its intention to call by lot on Dec. 1 $1,000,000 for the face value of its 5½ per cent debenture bonds due in 1947.

* * *

Ontario Steel Products Ltd., Cananoque, Ont., for the fiscal year ended June 30, had a net profit of $59,799 or 74 cents a common share. For the preceding year the net profit was $12,903.

* * *

Blaw-Knox Co. has declared a 15-cent quarterly dividend, payable Oct. 30 to Oct. 9 record, compared with 10-cent dividends in previous quarters of this year.



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Canadian Pig Iron Up 10%, Ferroalloys Fall In August

Canada's pig iron output for August registered a 10 per cent gain over July amounting to 38,570 tons as compared with 34,988 tons. Production of ferro-alloys amounted to 9,290 tons, as against 10,962 tons in July, and 3,893 tons in August, 1935. Output of steel ingots and castings rose from 68,793 tons in July to 80,164 tons in August, compared with 82,488 tons in August, 1935. Principal demand for steel came from the mining industry, with the automobile and building industries next.

Automobile factories in Canada produced only 4,660 units during August, as compared with 10,475 in July and 7,692 in August of last year. Imports for the month amounted to 448 units, and exports to 3,449, as compared with imports of 712 units and exports of 4,561 for July. Total production for the first eight months of the year was 121,083 units, a decline from the 132,027 cars and trucks made during the corresponding months of 1935.

Canadian imports of iron and steel for August had a total value of $9,299,000, a slight decline from the August, 1935, total of $9,389,000. The value of imports from the United States increased from $6,634,000 to $6,890,000. Machinery, the largest class of imports, had a total value of $1,986,000, as against $1,404,000 for the corresponding month of last year.

Exports for the month dropped from $4,091,000 to $3,579,000, exports to the United States being somewhat higher, at $492,000 as compared with $447,000 in August, 1935. The largest item was pig iron and steel ingots, with a value of $219,000.

Two Companies Revise Alloy Steel Prices

Vanadium Alloys Steel Co., Vascoloy-Ramet division, North Chicago, has announced a revised price schedule effective Oct. 1 for Tantalum carbide blanks and tipped tools used for machining steel and other metals. The new prices are based on a schedule of 45 cents a gram instead of the previous range of 90 to 40 cents, effecting simplicity in calculations, and a major reduction in the generally used sizes of blanks.

New catalogs are available from the North Chicago division.

Carboloy Co. Inc., Detroit, has announced a reduction in prices of Carboloy for tools and blanks effective Oct. 1. The new price of blanks for tool use will be based on 45 cents per gram in any size.

In addition to this, a further reduction in tool manufacturing labor is also effective on single point tools in quantities of 5 or over on any given tool. New price lists will be available shortly.

Mark Beautiful Bridge

A stainless steel plaque was bestowed upon the Mortimer E. Cooley bridge, Lansing, Mich., Sept. 17 by the American Institute of Steel Construction. The structure had been voted the most beautiful bridge of its size built last year. Alexander Miller, district engineer of the Institute, made the presentation.

General Electric's Orders This Year Up 33 Per Cent

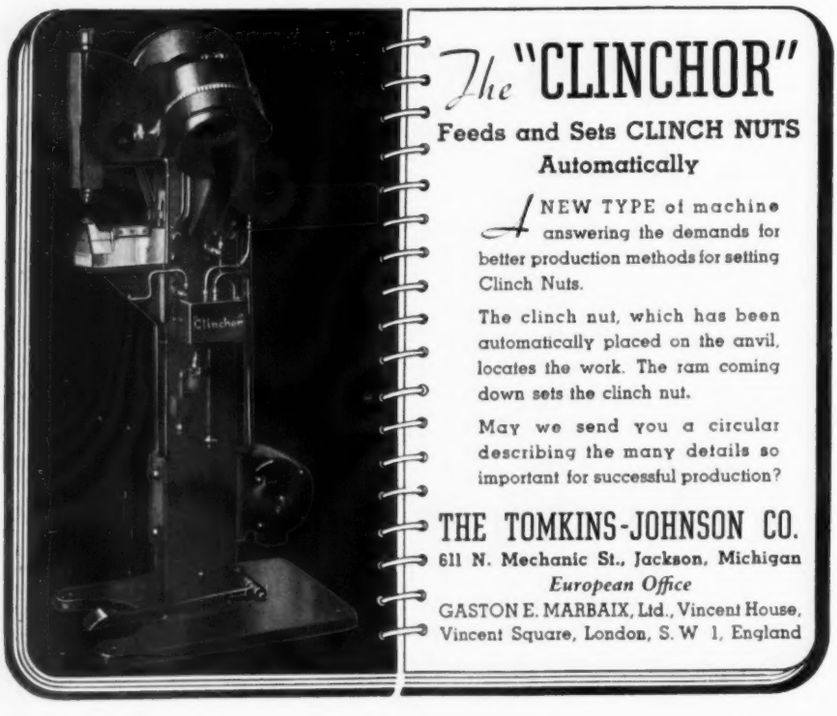
Orders received by the General Electric Co. during the third quarter of 1936 amounted to $74,922,441, compared with $54,400,819 during the third quarter, 1935, an increase of 38 per cent. Orders during the nine months amounted to $211,891,038, compared with $158,943,765 during the nine months last year, an increase of 33 per cent. Both for third quarter and first nine orders were larger than for any respective period since 1930.

Equipment

Pittsburgh—A large sheet mill in the Pittsburgh district has ordered 33 direct-fired unit heaters each with a B.t.u. capacity of 700,000 per hour, from the Dravo-Doyle Co., Pittsburgh, bringing their total installed over the last three years up to nearly 250 machines. Dravo-Doyle also has taken recent contract from Allegheny Steel Co. for two large stoker-fired heaters for the West Leechburg, Pa., division of the company and a similar order from the LaSalle Steel Co., South Chicago, Ill.

Chicago—Machine tool and plant equipment continues in a relatively active market here, with September sales generally reported about equal to those of August. In the case of machine tools, an upturn was reported by some interests, and with inquiries well maintained, October is expected to mark a continuation of last month's trend. Deere & Co. has closed on part of its recent list, while a few inquiries and orders are appearing from railroads. The latter are fairly active in buying repair parts as a result of increased operations at car shops. Deliveries on parts as well as on new machines are deferred, in some of the former cases as much as four weeks.

Demand for foundry equipment is spotty in some instances, but is holding fairly well. Purchases of major equipment by steel plants are light following considerable activity in this respect earlier in the year. Construction programs started several months ago by local steel interests in most instances are well advanced.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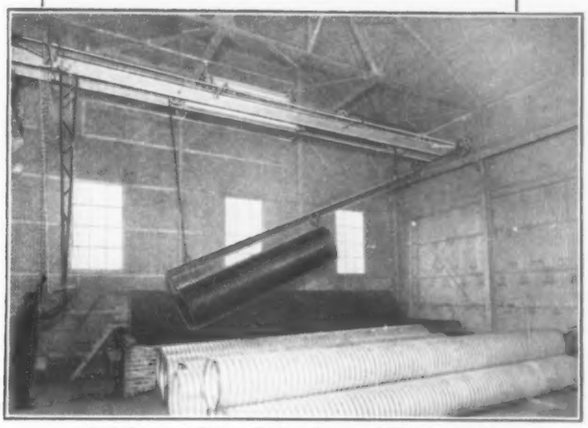

Curtis Pneumatic Crane at Tri-State Culvert and Mfg. Co., Memphis. One air cylinder for dipping, one for tilting to drain off asphalt coating solution.

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Construction and Enterprise

Ohio

BLOOMDALE, O. — Village plans to build fluoride reduction plant costing $8000. Bids will probably be asked around Oct. 19. Engineers are George Champe & Associates, 1025 Nicholas building, Toledo, O.

BLUFFTON, O. — Village plans construction of $116,000 sewage disposal plant. Fred Triblehorn is mayor, George Champe & Associates, 1025 Nicholas building, Toledo, O., engineers.

BERGHOLZ, O. — Village plans construction of waterworks system to cost $53,000. Engineers are Harrop, Hopkins & Taylor, 541 Wood street, Pittsburgh.

BUCYRUS, O. — City plans building sewage disposal plant to cost $75,000, and voters will pass at November election on proposal.

BUCYRUS, O. — City plans construction of sewage disposal plant to cost $140,000, PWA to furnish half of cost. George M. Birk is mayor, engineer is American Solvent Recovery Corp., 83 South High street, Columbus, O.

CINCINNATI — Village of Mt. Washington, A. S. Hibbs waterworks superintendent, City hall, Cincinnati, plans erection of 500,000-gallon steel elevated water tank. Village council has authorized applications for funds to PWA.

CIRCLEVILLE. O. — Ralston-Purina Co. plans construction of 2-story, 70 x 100-foot factory costing $40,000.

CLEVELAND — City division of water and heat, room 105, City hall, is taking bids due noon Oct. 9 for gas storage tanks and pumps, and for machine shop equipment, including two feed water heaters, one sump pump, three complete lathes and a milling machine.

ELYRIA, O. — Elyria Foundry Co., W. F. Goldman manager, will let contracts soon for construction of a 1-story, 80 x 400-foot foundry costing $100,000.

GALION, O. — City is considering construction of sewage disposal plant and American Solvent Recovery Corp., 83 South High street, Columbus, is surveying possibilities and cost. Voters will pass on a $60,000 bond issue at the November election. L. Cline is service director, City hall.

LEWISBURG, O. — Village will construct sewage disposal plant to cost $60,000, village to furnish $15,000, rest to come from WPA. R. G. Sever is city attorney, city hall. Voters will pass on bond issue at November election.

MECHANICSBURG, O. — Village is taking bids due noon Oct. 10 for sewage treatment plant materials costing $75,000. Engineer is Floyd G. Browne, Marion, O., and Charles A. Wood is village clerk.

MIDDLETOWN, O. — P. A. Sorg Paper Co., 901 Manchester avenue, plans building 2-story factory and power plant at 1730 Grand avenue at a cost of $40,000.

MONROEVILLE, O. — Village plans construction of water purification plant. Bond issue of $25,000 will be submitted to voters at November election. Clarence H. Zipfel is mayor, George Champe & Associates, 1925 Nicholas building, Toledo, O., engineers.

MT. VICTORY, O. — Village is taking bids due Oct. 10 for construction of pumphouse at waterworks, to cost $2000. Carl Simon, Van Wert, O., is engineer. Leonard Cox is village clerk.

NEW PARIS, O. — Village plans construction of sewage disposal plant with WPA aid, and a bond issue of $15,000 will be submitted to voters at November election.

OSBORN, O. — Village will build sewage disposal plant costing $140,000, bond issue to supply $48,500. Probable engineer is Collins H. Wight, Union Trust building, Dayton, O.

WADSWORTH, O. — City voters will pass at November election on issuance of $20,000 bonds for purchase of a water softener to be installed in waterworks plant.

WEST UNITY, O. — Village plans construction of waterworks plant and system to cost $70,000, bond issue of $28,000 to supply part of cost. W. E. Caughey is mayor, George Champe & Associates, 1025 Nicholas building, Toledo, O., engineers.

Michigan

CHELSEA, MICH. — Village will take bids probably about Nov. 15 for construction of sewage treatment plant to cost $54,000. A PWA grant of $24,300 has been approved. Roy Harris is mayor, George Champe & Associates, 1025 Nicholas building, Toledo, O., engineers.

DETROIT — Midland Die & Tool Co., 2650 Poplar avenue, has been incorporated. Correspondent is Stephen Stenger, 625 Field avenue.

DETROIT — Rinshed-Mason Co., paint manufacturer, will build an $18,000 addition to its plant at 5935 Milford avenue F. J. Winter, 2112 Book tower, is architect.

DETROIT — Buick Motor Co., General Motors building, has appropriated $14,500,000 for plant modernization in 1937. Every phase of manufacturing activity will be covered by the new construction, including new plants and equipment, new tooling and rearrangement of production facilities. Five new buildings will be erected. Harlow H. Curtice is president.

DUNDEE, MICH. — Village plans construction of sewage disposal plant costing over $25,000.

GRAND RAPIDS, MICH. — Air Reduction Co., 60 East Forty-second street, New York, will construct a $35,000 factory in Grand Rapids. Plans by company's engineering department.

FLINT, MICH. — City has completed plans for construction of $500,000 water softening plant, to be 2-story, 200 x 200 feet. PWA aid is sought. City engineer is O. K. Phillips, city hall, consulting engineer is Shoecraft, Drury & McNamee, American Savings Bank building, Ann Arbor, Mich.

GRAND RAPIDS, MICH. — National Brass Co., 1609 Madison avenue Southeast, will build an addition to its plant. Harry L. Mead, 902 Michigan Trust building, architect, is taking bids.

POINT PLEASANT, MICH.—City plans construction of municipal electric power plant to cost $485,000. A bond issue will be voted on to supply 55 per cent of this amount, and PWA will supply the rest. W. K. Willman is city manager, City hall.

SPRING LAKE, MICH. — Village plans to build sewage disposal plant costing $41,800, with PWA aid. Francis Engineering Co., Eddy building, Saginaw, Mich., is engineer.

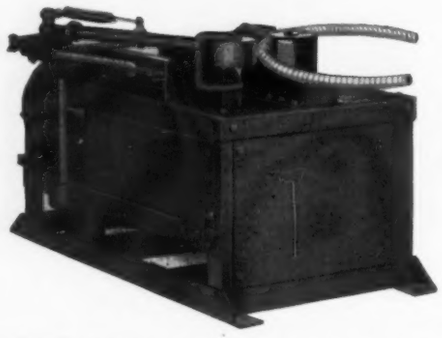
Illinois

CHICAGO — Rubens & Marble Co., Coyne and Cromwell avenues, will alter and improve its factory at Fullerton and Racine avenues, at a cost of over $75,000.

CHICAGO — Commonwealth Edison Co. plans expansion in power plant at 1121 Cermak road, to cost over $100,000. New equipment will be installed.

CHICAGO — Arnold Schwinn & Co.,

(*Please turn to Page 92*)



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It will handle 20 tons or more per day and will bend bars 1¼ in size. Several bars can be bent in one operation depending on the size of bars. Circles or radius of any size required in reinforcing work from 18" up can be bent. Bars with different radius can be bent in one operation without stopping machine.

This is a time proven machine and will prove a real saving to any operator with large tonnage over any other method of bending circle or radius work.

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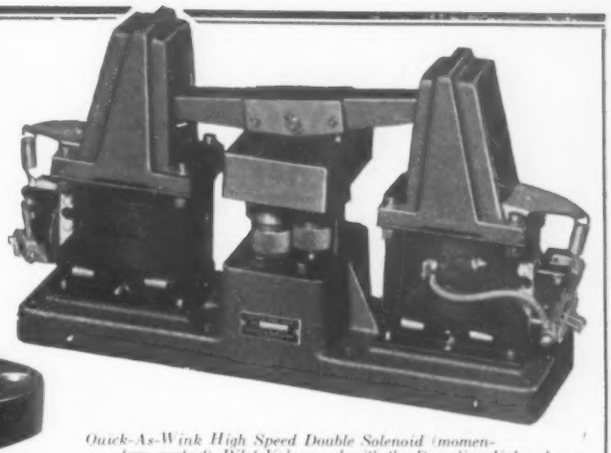

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(*Continued from Page* 90)

1718 North Kildare avenue, plans installation of motors and controls, conveyors and other equipment in new addition to bicycle manufacturing plant, at a cost of about $125,000.

CHICAGO — Goodman Mfg. Co., 4834 South Halstead street, plans construction of plant addition costing $45,000. Architects are Mundie & Jensen, 39 South LaSalle street.

CHICAGO — D. O. James Mfg. Co., 1114 West Monroe street, is taking bids for alteration and addition to building, expected to cost $50,000. C. Humber, 25 East Jackson street, is architect.

JONESBORO, ILL. — City will improve waterworks plant at cost of $49,090, with all funds coming from PWA. A pumphouse will be constructed housing a 500-gallons per minute gasoline driven pump.

MAYWOOD, ILL. — Village plans construction of two water softening plants to cost $323,637, with capacity of three million gallons daily. PWA has granted $145,637.

ROCKFORD, ILL. — Twin Disc Clutch Co. has purchased the factory formerly used by the Emerson-Brantingham Co., and will use it for manufacturing clutch and power transmission parts. New machinery may be installed.

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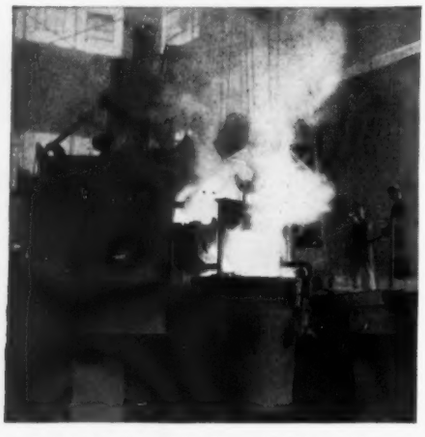

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Indiana

ANDERSON, IND. — City plans construction of electric power plant near Guide Light Corp. plant. Cost is estimated at $28,000.

ANDERSON, IND. — Kurry-Hughes Packing Co., 2000 West Eighth street, plans construction of two additions to packing plant, one to be 1-story, 70 x 150 feet, the other 3-story, 30 x 70 feet. Smith, Brubaker & Egan, engineers, 30 North La Salle street, Chicago, are taking bids. Total cost is estimated at $50,000.

BEDFORD, IND. — Coca Cola Bottling Works, R. A. Kremp manager, plans construction of new bottling plant here at the corner of Seventeenth and H streets, to cost $38,000 with equipment.

ELKHART, IND. — Riverside Brass Foundry Inc. has been organized to conduct a foundry for casting brass and other metals. Resident agent is Ruskin B. Phillips, 117 West Marion street.

INDIANAPOLIS — P. R. Mallory Co., 3029 Washington street, plans construction of a 1-story, 130 x 320-foot addition to plant. J. E. Kopf & Deery, 624 Indiana Pythian building, architects.

JASPER, IND. — Jasper Wood Products Co. will construct veneering unit addition at a cost of about $37,000 with equipment.

JEFFERSONVILLE, IND. — Colgate-Palmolive-Peet Co., Jersey City, N. J., plans installation of motors and controls, conveyors, regulators and other equipment in multi-story addition to soap and cosmetic manufacturing plant at Jeffersonville. Cost is estimated at close to $200,000.

UNION CITY, IND. — Village plans construction of sewage disposal plant and installation of distribution system, at cost of about $130,000. Hoover & Montgomery, 916 Atlas building, Columbus, O., engineers. Voters will pass on issuance of $15,000 bonds at November election.

VALPARAISO, IND. — City is considering complete electrification of waterworks pumping station in connection with extensions and improvement in plant and system. Cost is estimated at about $168,000. Charles Brossman, Chamber of Commerce building, Indianapolis, is engineer.

New York

BINGHAMTON, N. Y. — Prescott Mfg. Co., 261 Water street, plans construction of 3-story, 25 x 50-foot addition to cost $37,000. Architects are Jones & Jewell, Robinson building.

BUFFALO — Buffalo sewer authority, City hall, will take bids Oct. 20 for construction of a sewage disposal plant to cost $990,000 with equipment, to be built on Bird island. Greeley & Hansen, 6 North Michigan avenue, Chicago, are engineers.

EASTCHESTER, N. Y. — City plans construction of waterworks system costing over $50,000.

GRAND ISLAND, N. Y. — City will construct waterworks system costing $138,000, with PWA aid. Engineer is Nussbaumer & Clarke Inc., 327 Franklin street, Buffalo.

FREDONIA, N. Y. — Village plans expansion of municipal water works at a cost of $150,000, and will seek either PWA or WPA aid in financing.

MINOA, N. Y. — City plans constructing sewage disposal plant costing $202,000, and has applied for PWA and WPA aid. C. A. Conklin is village engineer.

NEW ROCHELLE, N. Y. — City plans waterworks construction costing over $50,000. Plans to buy New Rochelle Water Co. did not materialize.

NEW YORK — New York Edison Co., 12 Irving place, plans modernizing and improving steam-electric generating plant at First avenue and Thirty-ninth street, including installation of new equipment, at total cost of $600,000. Ernest M. Van Norden is company engineer.

OLCOTT, N. Y. — Village will spend $110,000 for constructing municipal waterworks, and federal funds have been allotted.

Massachusetts

ABINGTON, MASS. — Water department plans erecting steel storage tank on steel tower, to cost $17,000, PWA having granted $7800.

CHELSEA, MASS. — United States Rubber Co., 184 Commercial street, Malden, Mass., plans construction of a factory on Eastern avenue to cost $40,000.

WILLIMANSETT, MASS. — Hampden Brewing Co. plans construction of 2-story bottling plant to cost $40,000. Plans are by McClintock & Craig, 458 Bridge street, Springfield, Mass.

Missouri

MONTICELLO, MO. — Lewis County Rural Electric Co-operative plans erection of rural transmission lines in Lewis, Marion, Clark and Knox counties, at a cost of $235,000, loaned by REA.

ST. LOUIS — Union Electric Light & Power Co., Twelfth and Locust streets, plans an expansion program in the next 18 months, to cost $10,000,000. A 75,000-kilowatt turbogenerator will be installed in the Cahokia plant. Louis H. Egan is president.

ST. LOUIS — Banner Iron Works, 4560 Shaw boulevard, is starting construction of a 1-story foundry addition to its plant for making grey iron castings. About $30,000 will be spent, including expenditure for new equipment. W. T. Koken is president.

Texas

BAY CITY, TEX. — City will take bids soon for construction of municipal electric power plant, to include three diesel engine-generator units and accessories. Entire cost is estimated at $225,000, and

(*Please turn to Page* 94)

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(Concluded from Page 92)

Garrett Engineering Co., 308 Hughes street, Houston, Tex., is engineer.

BELLAIRE, TEX. — City plans construction of waterworks system, including erection of 100,000-gallon steel tank and installation of pumps. Garrett Engineering Co., Box 1726, Houston, Tex., is engineer.

DENTON, TEX. — City will receive bids Oct. 15 for diesel electric units for municipal power plant, to be from 1000 to 2000 volts. Cost is estimated at $100,000. W. N. Harris is city manager, city hall.

ROXTON, TEX. — Lamar county water control and improvement board, district 1, plans holding an election soon to pass on issuance of $60,000 bonds for construction of waterworks system, to include elevated steel tank and tower. Total cost will be $80,000. Engineer is W. F. Hicks, Paris, Tex.

Minnesota

FERGUS FALLS, MINN. — Lake Region Co-operative Electric association, Bayley building, Fergus Falls, Noble Huse secretary, plans erecting 700 miles of rural transmission lines in Otter Tail county and other districts, at a cost of $720,000. Federal aid in financing will be sought. Arnold J. Christopherson is engineer.

TROMMALD, MINN. — Butler Brothers, 135 East Eighth street, St. Paul, plan installation of heavy-duty motors and controls, power substation equipment, electric hoists, conveyors and other equipment in proposed iron ore concentration plant near Trommald. Cost is expected to be over $1,000,000.

Wisconsin

KIEL, WIS. — Herman G. Weer, Sheboygan, Wis., has leased idle plant of Kiel Machine Co. to manufacture paper converting machinery.

MILWAUKEE — Cleaver-Brooks Co., 135 West Wells street, manufacturer of tank car heaters and other high pressure steam heating specialties, is increasing its capital by $75,000 before expanding facilities for manufacturing.

MILWAUKEE — Wisconsin Ice & Coal Co., 1518 East North avenue, will build an addition for manufacturing artificial ice, to be 43 x 100 feet and 38 x 66 feet, at South Forty-third and West Orchard streets. Cost is estimated at $75,000.

MILWAUKEE — Automatic Products Co., 121 North Broadway, maker of control equipment for oil burners, electric refrigerators and air conditioners, has purchased an enameling unit with 60,000 square feet in the former plant of Fuller-Warren Co., 2506 North Thirty-second street, and will spend about $20,000 for alterations and a new heating system. R. W. Johnson is president.

Kansas

WICHITA, KANS. — Beech Aircraft Co., lessee of plant of Curtiss-Wright Airplane Corp., plans improvements to cost $40,000. Curtiss-Wright offices are at 30 Rockefeller plaza, New York.

South Dakota

WATERTOWN, S. DAK. — City plans building waterworks plant on Lake Kempeska, and a survey of the cost is now under way. E. H. Schultz is acting city engineer.

Nebraska

BEAVER CROSSING, NEBR. — Village plans constructing sewage disposal plant costing $35,000. WPA is contributing to cost. Scott & Scott, 522 Bankers Life building, Lincoln, Nebr., are engineers.

CHADRON, NEBR. — City will construct waterworks plant and system with aid of PWA allotment. Cost is expected to be $91,150. Engineer is Henningsen Engineering Co., Union State Bank building, Omaha, Nebr.

GENEVA, NEBR. — State board of control, O. R. Shatto secretary, Lincoln, Nebr., plans construction of waterworks plant at state industrial school for girls at Geneva. A PWA allotment of $10,000 has been granted.

INGLESIDE, NEBR. — Nebraska state board of control, Lincoln, Nebr., rejected bids submitted Sept. 15 for construction of sewage disposal plant at Ingleside state hospital, but bids will be asked again soon.

Pacific Coast

DECOTO, CALIF. — F. Thomas plans building box factory to cost $40,000 with equipment.

JACKSON, CALIF. — City plans construction of sewage disposal plant to cost $76,807, PWA to furnish $34,473. Engineer is J. S. Bates, 3134 Eaton avenue, Berkeley, Calif.

LOS ANGELES — Axelson Mfg. Co., 3844 Walsh street, is starting construction of an addition to its manufacturing plant, to cost $70,000. An additional $90,000 will be spent for new machinery and equipment.

PORTLAND, OREG. — Williams & Co., Northeast Union and Tillamook streets, plans installation of motors and controls, conveyors, and other equipment in new food products manufacturing plant. Cost will be close to $100,000. F. Marion Stokes, Terminal Sales building, is architect.

DES MOINES, WASH. — City plans municipal water system, including an elevated steel tank, to cost $21,140, and Parker & Hill, Smith tower, Seattle, are engineers in charge.

EVERETT, WASH.—Vanguard Metals Inc., 2919 Wetmore avenue, has been organized by T. W. Nevitt and associates.

KLAMATH FALLS, WASH. — American Lumber & Treating Co., R. M. Morris president, plans to construct a $150,000 wood treating plant.

RAYMOND, WASH. — Willapa Valley water district has approved a $19,000 bond issue toward financing a $71,000 water system project, to receive state and federal aid.

SEATTLE — City light officials are proceeding with plans for proposed $7,185,000 Ruby dam, Skagit hydroelectric project, for which PWA has granted $3,000,000.

SPOKANE — Washington Metals Inc., 423 Peyton building, has been organized by J. R. Foster and associates.

SPOKANE — Beryl Metals Co., 1235 East Thirty-fourth avenue, has been incorporated by P. H. Briscoe and associates.

SPOKANE — Isaacson Iron Works, 2917 East Marginal Way, Seattle, plans building a 1-story, 120 x 150-foot factory at Maple avenue and Pacific street, at a cost of $40,000. An additional $25,000 will be spent for equipment.

Canada

WINNIPEG, MAN. — A. Binkley, city clerk, will take bids in October for machinery and equipment to be installed in sewage disposal plant at a cost of $220,000. Details may be obtained from Greater Winnipeg Sanitary district board, City hall.

SAULT STE. MARIE, ONT. — Sault Structural Steel Co. Ltd. plans construction of power plant at a cost of $50,000.

WESTON, ONT. — Armstrong Door Co. Ltd., M. C. Cameron president, plans construction of sash and door manufacturing plant costing $40,000. Equipment will be purchased.

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